

Asteroid Spin-Rate Study using the Intermediate Palomar Transient Factory

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Received _____; accepted _____

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ABSTRACT

Two dedicated asteroid rotation-period surveys have been carried out using data taken on January 6-9 and February 20-23 of 2014 by the Intermediate Palomar Transient Factory (iPTF) in the R band with ~ 20 -min cadence. The total survey area covered 174 deg^2 in the ecliptic plane. Reliable rotation periods for 1,438 asteroids are obtained from a larger data set of 6,551 mostly main-belt asteroids, each with ≥ 10 detections. Analysis of 1751, PTF based, reliable rotation periods clearly shows the “spin barrier” at ~ 2 hours for “rubble-pile” asteroids. We also found a new large-sized super-fast rotator, 2005 UW163 (Chang et al. 2014b), and other five candidates as well. Our spin-rate distributions of asteroids with $3 < D < 15 \text{ km}$ shows number decrease when frequency greater than 5 rev/day, which is consistent to that of the Asteroid Light Curve Database (LCDB; Warner, Harris & Pravec 2009) and the result of Masiero et al. (2009). We found the discrepancy in the spin-rate distribution between our result and Pravec et al. (2008, update 2014-04-20) is mainly from asteroids with $\Delta m < 0.2 \text{ mag}$ that might be primarily due to different survey strategies. For asteroids with $D \leq 3 \text{ km}$, we found a significant number drop at $f = 6 \text{ rev/day}$. The YORP effect timescale for small-sized asteroid is shorter that makes more elongate objects spun up to reach their spin-rate limit and results in break-up. The K-S test suggests a possible difference in the spin-rate distributions of C- and S-type asteroids. We also find that C-type asteroids have a smaller spin-rate limit than the S-type, which agrees with the general sense that the C-type has lower bulk density than the S-type.

Subject headings: surveys - minor planets, asteroids: general

1. Introduction

Thanks to modern technology–wide-field detectors, high computing power, massive data storage, and robotic observation, it is possible to obtain plenty of asteroid lightcurves within a short period of time. Therefore, several important physical properties derived from asteroid lightcurves can be investigated in a more comprehensive way. For instance, the asteroid rotation period (P) is the most direct and essential property for understanding asteroids and the system they populate.

One of the key discoveries from asteroid rotation-period studies is the “spin barrier” at 2.2 hours for asteroids of diameters (D) > 1 km (Harris 1996), which is crucial evidence for supporting the “rubble-pile” model by which asteroids are believed to be made by gravitationally bounded aggregations and would breakup under such super-fast rotation with $P < 2.2$ hr. Pravec & Harris (2000) take a step further to show that the spin barrier can hold for large-sized asteroids (i.e., $D > 150$ m), and other small-sized asteroids, as coherent monoliths, are able to rotate faster than that limit (i.e., super-fast-rotator; hereafter, SFR; see examples therein Hergenrother & Whiteley 2011).

In fact, two large-sized SFRs have been discovered: 2001 OE84 ($D \sim 0.65$ km, $P = 29.19$ min; Pravec et al. 2002) and 2005 UW163 ($D \sim 0.6$ km, $P = 1.29$ hr; Chang et al. 2014b). A possible explanation for these large-sized SFRs is a size-dependent strength model for asteroids, in which the cohesiveness and tensile strength of the asteroids decrease as its size increases. Therefore, a smooth transition can occur between small monolithic asteroids and large rubble-pile asteroids (Holsapple 2007). In this way, a certain fraction of large-sized SFRs should be found in asteroid populations. Identification of these large-sized SFRs along with their physical properties, will provide definite answers about this special asteroid group.

Another notable discovery from analyzing asteroid rotation periods is that the spin-rate

distribution of smaller asteroids (i.e., $3 < D < 15$ km) have excesses both in the slow and fast ends. When an asteroid system reaches collisional equilibrium, it exhibits a Maxwellian spin-rate distribution (Salo 1987), which has been seen for asteroids of $D > 40$ km (Pravec et al. 2002). Therefore, the excesses of slow- and fast-rotating small asteroids become clear evidence of the Yarkovsky-O’Keefe-Radzievskii-Paddack effect altering the spin rate of small-sized asteroids on million year timescales (YORP; Rubincam 2000). However, the spin-rate distribution of small-sized asteroids is still under debate. Instead of the flat distribution reported by Pravec et al. (2002), a non-flat distribution (i.e., more closely resembling a Maxwellian) was found by Masiero et al. (2009), Polishook et al. (2012) and Chang et al. (2014a). Although the YORP effect can account for both cases, a detailed investigation is still needed to understand the spin-rate evolution of small asteroids.

Moreover, rubble-pile asteroids with a lower bulk density (ρ) should have a smaller spin-rate limit ($P \sim 3.3\sqrt{(1 + \Delta m)/\rho}$; Pravec & Harris 2000). Consequently, the overall spin rate of C-type asteroids (i.e., $\rho \sim 1.33 \pm 0.58$ g/cm³) should be lower than for the S-type (i.e., $\rho \sim 2.72 \pm 0.54$ g/cm³) (DeMeo & Carry 2013). Although Chang et al. (2014a) attempted to investigate whether this trend exists between various spectral-type asteroids, the conclusion was still preliminary due to only a few tens of objects available in their samples.

To gain a more comprehensive understanding with respect to the aforementioned questions, we continued our previous study and conducted two more asteroid rotation-period surveys of data taken on January 6-9 and February 20-23 of 2014 by the iPTF¹. These surveys included more samples and a higher level of completeness. The total survey area was ~ 174 deg² over the ecliptic plane, and 6,551 asteroids of ≥ 10 detections were obtained. From these lightcurves, 1,438 reliable rotation periods were derived and among them we

¹Intermediate Palomar Transient Factory; <http://ptf.caltech.edu/ipTF>

found six large-sized SFR candidates, one of which, (335433) 2005 UW163, was confirmed via follow-up observation (Chang et al. 2014b).

We describe the observation information and lightcurve extraction in Section 2. The periodicity analysis is given in Section 3. The results and discussion are presented in Section 4. A summary and conclusion can be found in Section 5.

2. Observations and Data Reduction

The PTF project, and its successor iPTF project, employs the Palomar 48-inch Oschin Schmidt Telescope equipped with an 11-chip mosaic CCD camera to explore the transient and variable sky synoptically. This configuration creates a field of view of $\sim 7.26 \text{ deg}^2$ and a pixel scale of $1.01''$ (Law et al. 2009; Rau et al. 2009). Most PTF exposures are taken in the Mould- R band, and the other available filters are the Gunn- g' and two different H_α bands. A 60-second R -band exposure can reach a median limiting magnitude of ~ 21 mag at the 5σ level (Law et al. 2010).

Each PTF exposure is processed by the IPAC-PTF photometric pipeline, which includes image splitting, de-biasing, flat-fielding, source extraction, astrometric calibration, and photometric calibration to generate reduced images and source catalogs (Grillmair et al. 2010; Laher et al. 2014). The absolute magnitude calibration is done against Sloan Digital Sky Survey fields (hereafter, SDSS; York et al. 2000) on a per-night, per-filter, per-chip basis, and routinely reaches a precision of ~ 0.02 mag on photometric nights (Ofek et al. 2012a,b). Small photometric zero-point variations are possible between catalogs of different nights, fields, filters and chips. Its accuracy depends on the degree affected by weather and transient variations in atmospheric conditions within a night.

To collect a large sample size of asteroid lightcurves for furthering our previous asteroid

spin-rate studies (Polishook et al. 2012; Chang et al. 2014a), we conducted two asteroid rotation-period surveys during January 6-9 and February 20-23 in 2014. Each survey continuously scanned twelve consecutively numbered PTF fields in the ecliptic plane in the R -band with a cadence of ~ 20 min. The exposure time of each frame was 60 s, and the scanned sky coverage was $\sim 174 \text{ deg}^2$ in total. The observational metadata are given in Tables 1, and the field configurations are shown Fig. 1 and 2. After purging all stationary sources, the source catalogs were matched against the ephemerides obtained from the *JPL/HORIZONS* system with a radius of $2''$ to extract the lightcurves of known asteroids. We also excluded any detection flagged as a defect by the IPAC-PTF photometric pipeline from the lightcurves. In the end, we were left with 6,551 asteroid lightcurves, each with ≥ 10 data points (hereafter, PTF-detected asteroids) for the following rotation-period analysis.

3. Rotation-Period Analysis

Before measuring rotation period, the orbital elements obtained from the Minor Planet Center² were used to correct for light-travel time and reduce magnitudes to both heliocentric, r , and geocentric, Δ , distances at 1 AU for all PTF-detected asteroids. Moreover, the absolute magnitudes, H_R , were simply estimated by applying a fixed G_R slope of 0.15 in the H – G system (Bowell et al. 1989) due to the small change in phase angles within our four-night observations.

We followed the traditional second-order Fourier series method to fit our lightcurves

²<http://minorplanetcenter.net>

(Harris et al. 1989):

$$M_{i,j} = \sum_{k=1,2}^{N_k} B_k \sin \left[\frac{2\pi k}{P} (t_j - t_0) \right] + C_k \cos \left[\frac{2\pi k}{P} (t_j - t_0) \right] + Z_i, \quad (1)$$

where $M_{i,j}$ is the R -band reduced magnitude measured at the light-travel time corrected epoch t_j , B_k and C_k are the Fourier coefficients, P is the rotation period, and t_0 is an arbitrary epoch. Here, we also introduced a constant value Z_i to correct the small photometric zero-point variations between data acquired from different nights, fields, filters and chips. Then, Eq. (1) was solved by using least-squares minimization for each given P to obtain other free parameters. The spin-rate (f) range was stepped through from 0.25 to 25 rev/day (e.g., about 1 to 96 hr) with increments of 0.025 rev/day.

The results were reviewed and a quality code (U) was manually assigned to each folded lightcurve, where: ‘3’ means highly reliable; ‘2’ means some ambiguity; ‘1’ means possible, but may be wrong (Warner, Harris & Pravec 2009). Moreover, when the lightcurve was unable to find any acceptable solution, it was assigned $U = 0$. The uncertainty of the derived rotation period was estimated from periods having χ^2 smaller than $\chi_{best}^2 + \Delta\chi^2$, where χ_{best}^2 is the χ^2 of the derived period and $\Delta\chi^2$ is calculated from the inverse χ^2 distribution, assuming $1 + 2N_k + N_i$ degrees of freedom. The amplitude was calculated from the peak-to-peak variations after rejecting the upper and lower 5% of data points to avoid outliers, which are probably contaminated by nearby bright stars or unfiltered artifacts from the lightcurve extraction.

4. Results and Discussion

Most PTF-detected asteroids are main-belt asteroids, and the others include Hilda, Jovian Trojan, and near-Earth objects. If the object are available in *WISE/NEOWISE* data set (Grav et al. 2011; Mainzer et al. 2011; Masiero et al. 2011), then we adopted their

diameter estimation. Otherwise, the diameter was estimated using

$$D = \frac{1130}{\sqrt{p_R}} 10^{-H_R/5}, \quad (2)$$

where D is the diameter in km, p_R is the R -band geometric albedo, and 1130 is the conversion constant adopted from Jewitt, Ishiguro & Agarwal (2013). We assumed three empirical albedo values, $p_R = 0.20, 0.08$ and 0.04 , for objects in inner ($2.1 < a < 2.5 \text{ AU}$), mid ($2.5 < a < 2.8 \text{ AU}$) and outer ($a > 2.8 \text{ AU}$) main belts, respectively (Tedesco, Cellino & Zappalá 2005).

4.1. Derived Rotation Periods

From PTF-detected asteroids, we obtained 1,438 reliable (i.e., $U \geq 2$) rotation periods (hereafter, PTF-U2s). The magnitude distributions of the PTF-detected asteroids vs. PTF-U2s are shown in Fig. 3, which peak at ~ 20.5 and ~ 19.5 mag, respectively. Fig. 4 shows the plot of the semi-major axis vs. diameter for PTF-U2s, where we see the low-limit diameters increasing as a function of semi-major axis. The derived rotation periods and lightcurve amplitudes, along with the orbital elements and observational conditions, are summarized in Table 2, and their folded lightcurves are provided in Figs. 13-14.

In addition, there are 169 objects having folded lightcurves with partial coverage in rotational phase, but nevertheless a clear trend (hereafter, PTF-Ps). Most PTF-Ps seem to be long-period objects (i.e., $f < 2 \text{ rev/day}$), and therefore we only can obtain their partial lightcurves. We estimated a lower limit on the amplitude based on the lightcurve variation and their actual rotation period should be longer than the derived. These objects are summarized in Table 3 and their folded lightcurves are given in Fig. 15-??.

We also found 63 asteroids showing large amplitudes and deep V-shaped minima in their lightcurves (see Fig. 16). Most of them are probably contact binaries or very elongate

asteroids, which have smooth transitions from minimum to maximum (see 3169 Ostro as an example in Descamps et al. 2007). Among them, we use the typical features of lightcurve for binary asteroid, a deep V-shaped minimum with a “shoulder” due to the abrupt drop in brightness at the onset of eclipse/occultation and an inverse U-shaped maxima (Behrend et al. 2006), to identify several binary asteroid candidates, which are 51495 and 56005, and maybe 46165 and B4348. These candidates need to be confirmed by follow-up observations. Moreover, the asynchronous binary candidate, (69406) 1995 SX48 (Warner 2014), was also observed in our survey, and we detected a primary rotation period of ~ 4.49 hr from our relatively scattered lightcurve.

Among the 1,438 PTF-U2s, 65 objects have published rotation periods in the Asteroid Light Curve Database (LCDB; Warner, Harris & Pravec 2009)³. To ensure the reliability of our period analysis, we compared the rotation periods between our survey data and those of matching objects in the LCDB, and show the results in Fig. 5. Most of the matches have consistent derived rotation periods. However, there are 13 outliers. Despite the six PTF-Ps (1449, 2009, 3014, 3031, 5450 and 5535) that are relatively uncertain in our determination of rotation periods and the four (2317, 3813, 4174 and 10187) that have better quality codes in our results than in the LCDB, there are still three outliers (1625, 4936 and 185086) having rotation periods that are significantly different from the rotation period of its LCDB counterpart within a reasonable uncertainty. The possible reasons are discussed below.

Asteroid 1625 has a long rotation period of 13.96 hr with $U = 3$ (Higgins 2011). We were only able to obtain part of its full lightcurve, and thus derived a rotation period of 18.82 hr, which is $\sim 4/3$ of the corresponding LCDB rotation period (see Fig. ??).

Asteroid 4936 has $U = 2$ ratings from both our determination and the LCDB. When

³<http://www.minorplanet.info/lightcurvedatabase.html>

the PTF lightcurve is folded with the rotation period of 13.83 hr listed in the LCDB, it does not give a clear trend. However, folding the PTF lightcurve with a rotation period of 19.2 hr gives a much better result, one that looks better, in fact, than the similarly folded lightcurve for this asteroid reported by Pray et al. (2008). Therefore, we believe our rotation period is more accurate than the LCDB rotation period.

Asteroid 185086 also has a long rotation period of 9.08 hr with $U = 3$ (Masiero et al. 2009). It is also a faint object (see Fig. ??), which is one possible reason for why we were only able to obtain only a sparse lightcurve, and therefore make a less accurate determination of its rotation period.

Among the 6,551 PTF-detected asteroids, 96 objects have $R < 19$ mag (i.e., large-sized) and $\Delta m > 0.5$ mag, but do not have a rotation-period determination. These asteroids are listed in Table 4. The associated lightcurves show a long-trend variation over our four-night observing-time span, suggesting that they very likely have a spin rate of < 1 rev/day. In order to obtain their relatively long rotation periods, observations with a longer time baseline are required, which is beyond the capability of our present survey strategy. Thus, we cannot more accurately determine the spin rates of these large-sized, long-period asteroids.

4.2. Detecting Simulation for Asteroid Rotation Period

We adopted similar approach described in Masiero et al. (2009) to carry out the detecting simulation for asteroid rotation period. The apparent magnitude (m) distribution of PTF-detected asteroids can be described as

$$N = \frac{2.5^{(M-12)}}{1 + e^{(M-20.5)/0.25}}. \quad (3)$$

This function accounts for the number increase and falloff along with apparent magnitude in a magnitude-limited survey (Jedicke & Herron 1997). Instead of using sophisticated asteroid shape to construct synthetic lightcurve that introduces formidable time-consuming computation, the synthetic objects were assumed relaxed triaxial ellipsoids having equal axes in b and c and rotating around the principle-axis a . Therefore, the lightcurves can be written as

$$m = 2.5 \log_{10} \sqrt{1 + \left[\left(\frac{b}{a} \right)^2 - 1 \right] \cos^2(2\pi\phi) \sin^2 \theta}, \quad (4)$$

and the amplitude (Δm) can be written as

$$\Delta m = 2.5 \log_{10} \left[\cos^2 \theta + \left(\frac{b}{a} \right)^2 \sin^2 \theta \right]^{-1/2}, \quad (5)$$

where ϕ is rotational phase and θ is the angle between line of sight and spin vector (Lacerda & Luu 2003; Lacerda & Jewitt 2007). The cadences of the synthetic lightcurves were chosen to be identical with the survey observations and the numbers of synthetic measurements were assigned according to the number of detections of PTF-detected asteroids with different apparent magnitudes.

We generated 402,000 synthetic lightcurves that uniformly distribute in frequency of $0 \leq f \leq 12$ rev/day, in pole orientation of $10 \leq \theta \leq 90$ degree and in axis ratio of $0.1 \leq b/a \leq 1$. Then, these synthetic lightcurves were analyzed by the aforementioned second-order Fourier series method to search for assigned periods. We defined a successful period determination as : (a) the derived period is within 5% of the original period, (b) the folded lightcurve of the derived period has double peaks or double dips and (c) the assigned photometric error is smaller than the derived amplitude. Therefore, the “PTF-P”-like objects could not be picked up in the simulation.

Fig. 6 shows the detection rate of f vs. Δm for various apparent magnitude intervals. In general, the detecting efficiency increases with Δm and decreases with m . Moreover,

the detection rate becomes very low for long-period objects that we see an obvious drop off at $f < 1.5$ rev/day. When the assigned photometric error is comparable with Δm for a synthetic object, the simulation would not be able to detect its rotation period. Therefore, the chance of detecting small-amplitude objects becomes much lower for faint objects. However, we do not see any favoring of detecting particular frequency with fixed lightcurve amplitude except for long-period objects (i.e., $f < 1.5$ rev/day). Then, we applied these detection rate to debias our result with interval of $\Delta m = 0.1$ mag, $f = 0.5$ rev/day and $m = 0.5$ mag. It is worth to note that the triaxial ellipsoid used in the simulation could not fully represent the sophisticated asteroid shape that would overestimate the detecting rate especially for low-amplitude object. However, including all possible asteroid shapes in such simulation to investigate the biases from various factors in a detailed way would become a formidable computing process that is far beyond the scope of this study. Our simulation can be the first step to understand whether the survey and the analysis tend to detect particular frequencies.

4.3. Statistical Analysis

4.3.1. Spin-Rate Limit and Mean Spin Rate

To compare PTF results obtained both from this work and Chang et al. (2014a), i.e., 1,751 PTF-U2s in total, with the objects of $U = 2$ in the LCDB, Fig. 7 shows the plot of diameter vs. rotation period for objects having quality code $U = 2$. Because of our four-night observing-time span and limiting-magnitude range, most PTF-U2s are confined to the region of $2 < P < 20$ hr and $1 < D < 10$ km, where most LCDB objects populate. The 2.2 hr spin barrier is clearly seen for objects of $D > 150$ m, which indicates the spin-rate limit for rubble-pile asteroids under self-gravity. A small group of monolithic SFRs located at $D < 150$ m and $P < 2.2$ hr, which can survive fast rotation without

breakup, due to other mechanical forces besides self-gravity. In addition to 2001 OE84, we also found six large SFRs candidates, (320292) 2007 RO221, (334904) 2003 WL167, (335433) 2005 UW163, (337226) 2000 EL98, (346352) 2008 RM118, and 2006 AF62 (see Fig. 17), in which the super fast rotation of 2005 UW163 has been confirmed (Chang et al. 2014b). While we plot the spin rate vs. amplitude in Fig. 8, all SFRs have bulk density $\rho > 3 \text{ g/cm}^3$ if $P \sim 3.3\sqrt{(1 + \Delta m)/\rho}$ is applied for rubble-pile asteroids, where Δm is the lightcurve amplitude (Pravec & Harris 2000). Such high bulk density is very unusual among asteroids. The size-dependent strength model (Holsapple 2007) provides an alternative explanation, and we thus should observe a certain fraction of large SFRs. Although the five unconfirmed SFR candidates show reasonably good folded lightcurves, their super fast rotations still need to be verified by follow-up observations to exclude the possibility of noise-induced false-positive detections (Harris, Pravec & Warner 2012). If the SFR population is consistent with the overall asteroid spin-rate distribution, then we can rule them out as a distinct asteroid group.

The inset plot of Fig. 7 is a detailed view of the dense region, where the regressions of the spin rate for PTF-U2s and LCDB are computed using locally weighted scatterplot smoothing (LOWESS; Cleveland 1979). Both regressions share a similar trend that is flat for small-sized asteroids and then gradually changes to longer rotation periods for larger-sized asteroids.

4.3.2. *Spin-Rate Distribution*

The spin-rate distribution for small-sized asteroids is important for understanding the evolution of asteroid systems. At the moment the available catalogs with large data volume include Pravec et al. (2008), Masiero et al. (2009, hereafter, M09) and the LCDB. Pravec et al. (2008) have been collecting asteroid spin rate for more than a decade; therefore, the

version of April 20 2014 of their data set containing 462 asteroids is used in the following analysis (hereafter, P08, update 2014-04-20; private communication). We also include PTF-Ps in the spin-rate distribution of PTF-U2s by doubling their derived rotation period as suggested by their folded lightcurve. $\sim 95\%$ of them are of $f \leq 2$ rev/day, and the contribution of the rest is very limited with respect to the whole PTF-U2s. In addition, the detecting simulation does not pick up the “PTF-P”-like objects that results in an underestimated detection rate for $f \leq 2$ rev/day and consequently an overestimation for long-period asteroids in the debiased result. Therefore, these two bins have relatively large uncertainty that we see them as a reference and not considered in the following discussion.

To have compatible diameter range with P08 (update 2014-04-20), we use asteroids of $3 < D < 15$ km (hereafter, D3-15) to compare the spin-rate distributions in Fig. 9. In contrast to P08 (update 2014-04-20), none of PTF-U2s, M08 and LCDB have a flat distribution, which is quasi-Maxwellian for PTF-U2s (i.e., a peak at $3 \leq f \leq 5$ rev/day and a slow decrease after) and looks like a step function with a number decrease at $f = 6$ rev/day for M09 and LCDB. With debiased PTF-U2s, we cannot obtain a distribution as flat as P08 (update 2014-04-20) and the number decrease still remains. When these samples are divided by $\Delta m = 0.2$ mag, the spin-rate distributions become more consistent with each other for asteroids with $\Delta m > 0.2$ mag (i.e., quasi-Maxwellian). To have a further investigation, we separate them into inner ($2.1 < a < 2.5 AU$), mid ($2.5 < a < 2.8 AU$) and outer ($a > 2.8 AU$) main belt for a detail investigation. Note that M09 is no longer included in the following analysis due to its insufficient number of sample for finer parameter space. Fig. 10 shows the difference between P08 and the others are mainly from asteroids with $\Delta m < 0.2$ mag where P08 (update 2014-04-20) has relative more fast rotators (i.e., $f \geq 6$ rev/day). We believe this discrepancy could be primarily due to different survey strategies as pointed out by Masiero et al. (2009). However, this requests a more comprehensive study. Although the quasi-Maxwellian distribution could possibly be an observational bias

due to a greater ability in detecting $2 \leq f \leq 5$ rev/day (Harris, Pravec & Warner 2012), we do not see this situation in the spin-rate distributions for various intervals of Δm (i.e., roughly flat for asteroids with $\Delta m < 0.2$ and $0.2 < \Delta m < 0.4$ mag). Moreover, most of asteroids with $\Delta m \geq 0.4$ mag are of $2 \leq f \leq 5$ rev/day and only a few at $f \geq 6$ rev/day that consists with the sense of lower spin-rate limit for large-amplitude asteroid (see Fig. 8). Moreover, our detection simulation shows roughly fair detection rate for $f > 2$ rev/day. This indicates that the quasi-Maxwellian distribution for D3-15 asteroids is not a result of favoring to detect asteroids of $2 \leq f \leq 5$ rev/day.

When we look at the spin-rate distribution of asteroids with $D < 3$ km in Fig. 11, we notice an obvious number decrease at $f = 6$ rev/day both in PTF-U2s and debiased PTF-U2s. This number drop still remains when applying a amplitude limit of $\Delta m > 0.2$ mag. Since the YORP effect timescale is relatively shorter for asteroids of $D < 3$ km and moreover the spin-rate limit is lower for large-amplitude asteroids, we believe that more large-amplitude asteroids of $D < 3$ km have been spun up to reach their spin-rate limit and broken up when comparing with D3-15 asteroids that results in a number decrease at $f = 6$ rev/day. Note that the small numbers at $f < 3$ rev/day in PTF-U2s is due to the lower detection rate for small-sized asteroids with long period. However, this deficiency becomes more comparable after debiasing.

Our result does not affected much by applying a brighter limiting magnitude of 19 mag (see bottom rows in Fig. 10 and Fig. 11), such that our conclusion remains the same.

4.3.3. *Spin Rate vs. Spectral Type*

In PTF-U2 and LCDB data sets, there are 478 C-type, 928 S-type, and 136 V-type asteroids according to SDSS colors. When we look at the plot of diameter vs. rotation

period (left panel in Fig. 12) and the plot of spin rate vs. lightcurve amplitude (middle panel) for the C-, S-, and V-types (upper, middle and lower panels, respectively), all of them occupy similar regions in rotation-period or spin-rate spaces. Because of the limiting magnitude of the observations and the various geometric albedo values involved, the asteroids have different diameter ranges. We note that C- and V-type asteroids seldom have objects with $P > 100$ hr and $P > 20$ hr, respectively. We see the S-type and V-type show clear boundaries at $\rho = 2$ g/cm³, and the C-type seems to have a boundary at $\rho = 1.5$ g/cm³ with a small group extending to $\rho = 2$ g/cm³. Therefore, the C-type asteroids have much fewer objects with $f > 8$ rev/day. Since M-type and E-type asteroids cannot be separated from C-type asteroids by SDSS colors, the small group in the C-type asteroids is properly due to those indistinguishable M-type and E-type asteroids, which have larger bulk density with respect to C-type. Despite the small group of C-type, what we see here is in a good agreement with the general sense of a lower bulk density for C-type relative to S-/V-type. For a comparison without possible incompleteness at the large/small-sized ends, we controlled our samples in the range of $3 < D < 20$ km to generate spin-rate distributions for these three asteroid types (right panel of Fig. 12), in which there were 229, 657, and 81 objects, respectively. The overall shapes do not appear to be the same, but all distributions peak at $2 \leq f \leq 5$ rev/day. Besides, the C-type distribution is more Maxwellian-like. The Kolmogorov-Smirnov test on the spin-rate distribution gives p -values of 0.01, 0.003, and 0.026 for each pairing of CS, CV and SV types, respectively. This indicates that their spin-rate distributions might be different to each other. However, this preliminary study needs to be confirmed when the samples are more complete in the parameter space.

5. Summary

Two surveys for asteroid rotation periods have been carried out by using the iPTF in January 6-9 and February 20-23 of 2014. We obtained 1,438 rotation periods from this campaign having quality codes $U \geq 2$, and most of them are associated with main-belt asteroids. There are 53 survey objects that match objects in the LCDB, and the derived rotation periods between these data sets are in mostly good agreement, an indication that our analysis is reliable.

Integrating this result with our previous study (Chang et al. 2014a), we found the spin-rate distributions for D3-15 asteroids of PTF-U2s, M09 and LCDB are quasi-Maxwellian that shows number decrease with frequency for $f > 5$ rev/day. The discrepancy between P08 (update 2014-04-20) and the others is mainly from asteroids with $\Delta m < 0.2$ mag that properly due to different approaches of acquiring samples of asteroid rotation period. In addition, we found a significant number drop at $f = 6$ rev/day for asteroids of $D < 3$ km. This might be explained by YORP effect which works faster on small-sized asteroids and push those elongate objects over their lower spin-rate limit to create this number drop at $f = 6$ rev/day.

Along with a confirmed large-sized SFR, 2005 UW163 (Chang et al. 2014b), we also found other five SFR candidates. If $P \sim 3.3\sqrt{(1 + \Delta m)/\rho}$ is followed for these asteroids, then their bulk densities are all much larger than 3 g/cm^3 . This suggests that cohesiveness and tensile strength, in addition to self-gravity, should also play roles in keeping them from breaking apart under such fast rotation.

With the available SDSS colors, C-, S- and V-type asteroids might have different distributions. However, their Maxwellian-like distributions suggests that they still retain certain degree of collisional equilibrium. Moreover, we note that evidence suggests that C-type asteroids have a lower spin-rate limit than the S-type. This agrees with the general

sense that C-type asteroids have a lower bulk density than the S-type.

This work is supported in part by the National Science Council of Taiwan under the grants NSC 101-2119-M-008-007-MY3 and NSC 102-2112-M-008-019-MY3. We thank the referees, Petr Pravec and Alan Harris, for their useful suggestions and comments to improve the content of the paper. This publication makes use of data products from *WISE*, which is a joint project of the University of California, Los Angeles, and the Jet Propulsion Laboratory/California Institute of Technology, funded by the National Aeronautics and Space Administration. This publication also makes use of data products from *NEOWISE*, which is a project of the Jet Propulsion Laboratory/California Institute of Technology, funded by the Planetary Science Division of the National Aeronautics and Space Administration. We gratefully acknowledge the extraordinary services specific to *NEOWISE* contributed by the International Astronomical Union’s Minor Planet Center, operated by the Harvard-Smithsonian Center for Astrophysics, and the Central Bureau for Astronomical Telegrams, operated by Harvard University.

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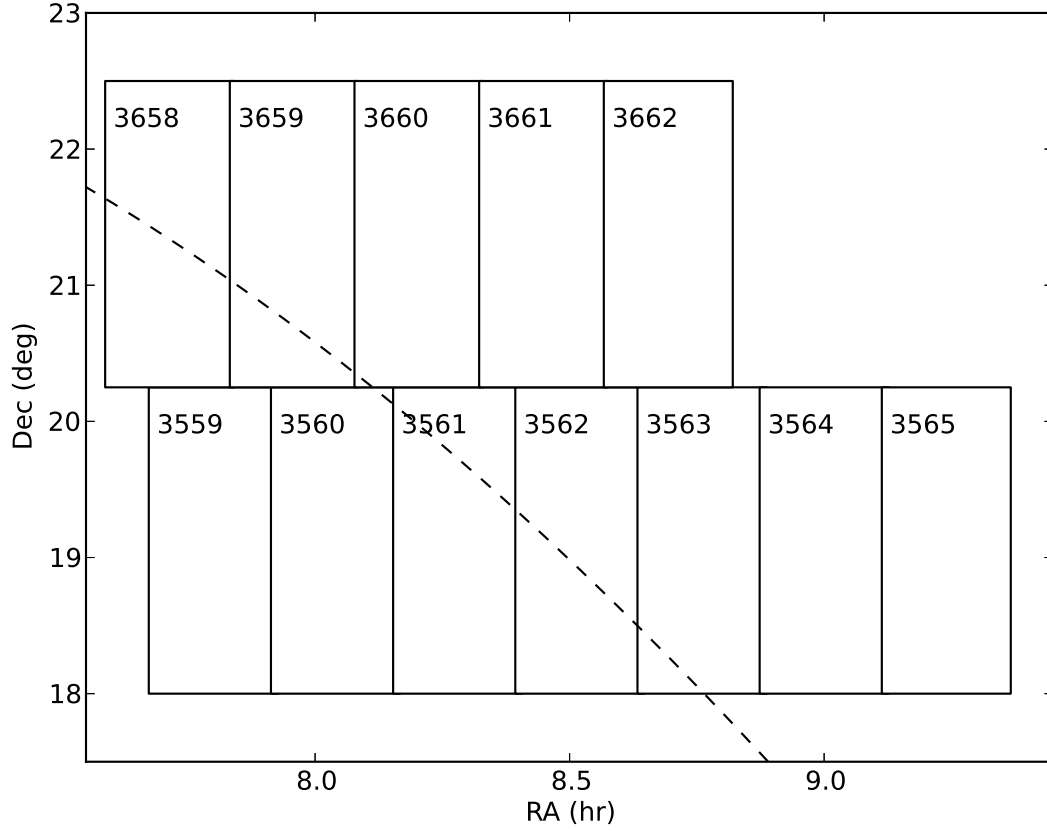


Fig. 1.— Field configurations for survey data taken in January 2014. The rectangles show PTF fields with corresponding field ID. The dashed line shows the position of the ecliptic plane. Note that the scales of right ascension and declination are different.

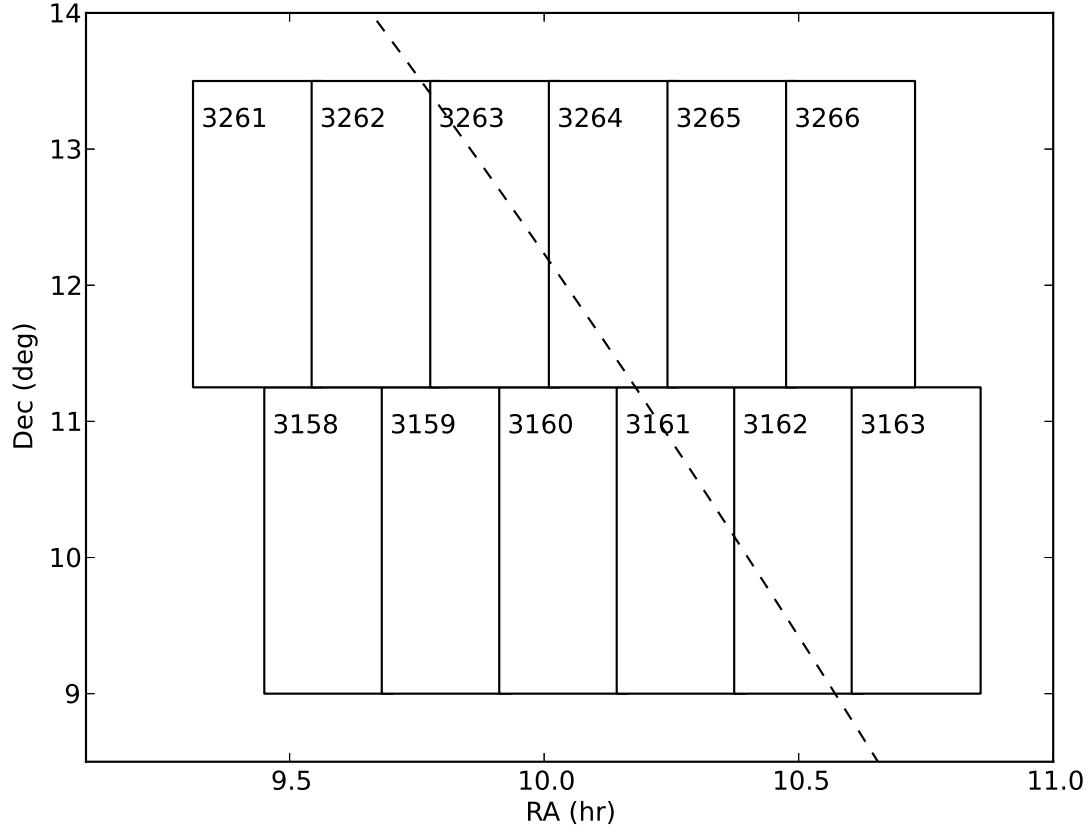


Fig. 2.— Field configurations for survey data taken in February 2014. The rectangles show PTF fields with corresponding field ID. The dashed line shows the position of the ecliptic plane. Note that the scales of right ascension and declination are different.

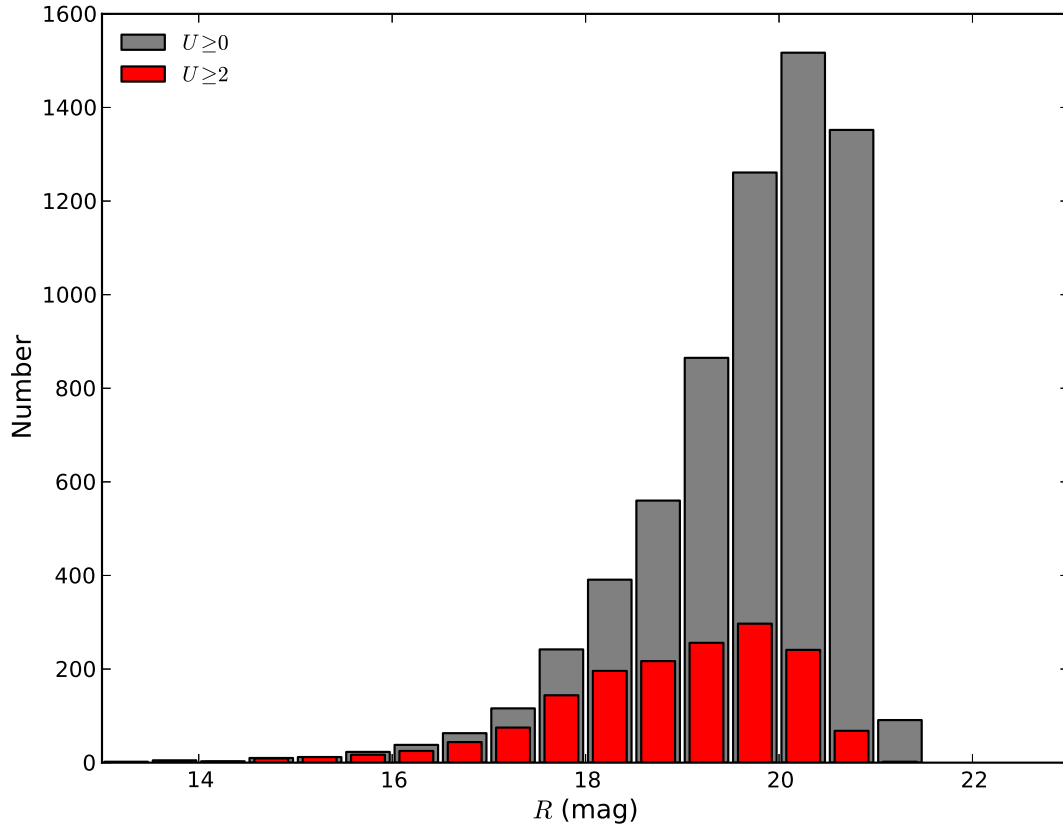


Fig. 3.— Magnitude distributions of PTF-detected asteroids (gray, $U > 0$) vs. PTF-U2s (red, $U \geq 2$). (Values of quality code U are defined in Section 3.)

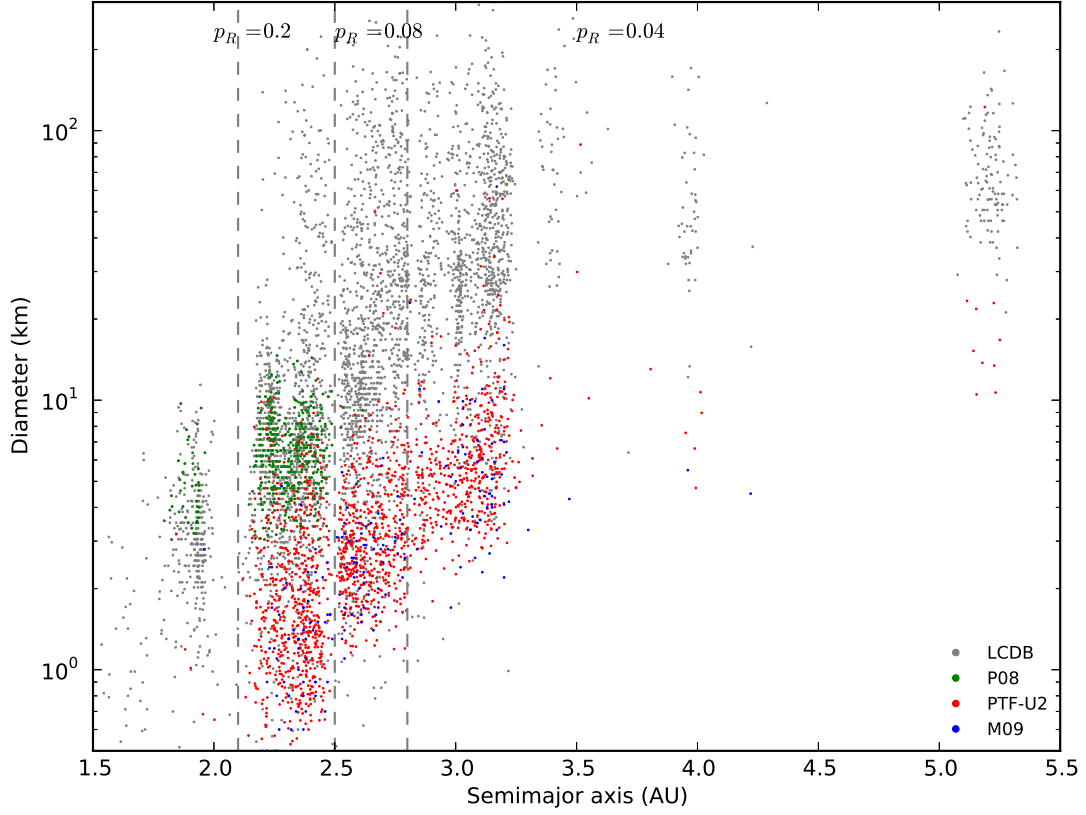


Fig. 4.— Diameter vs. semi-major axes for PTF-U2s (red), P08 (update 2014-04-20, green), M09 (blue) and LCDB (gray). The dashed lines show the divisions of empirical geometric albedo (p_R) for asteroids located at different regions of the semi-major axis.

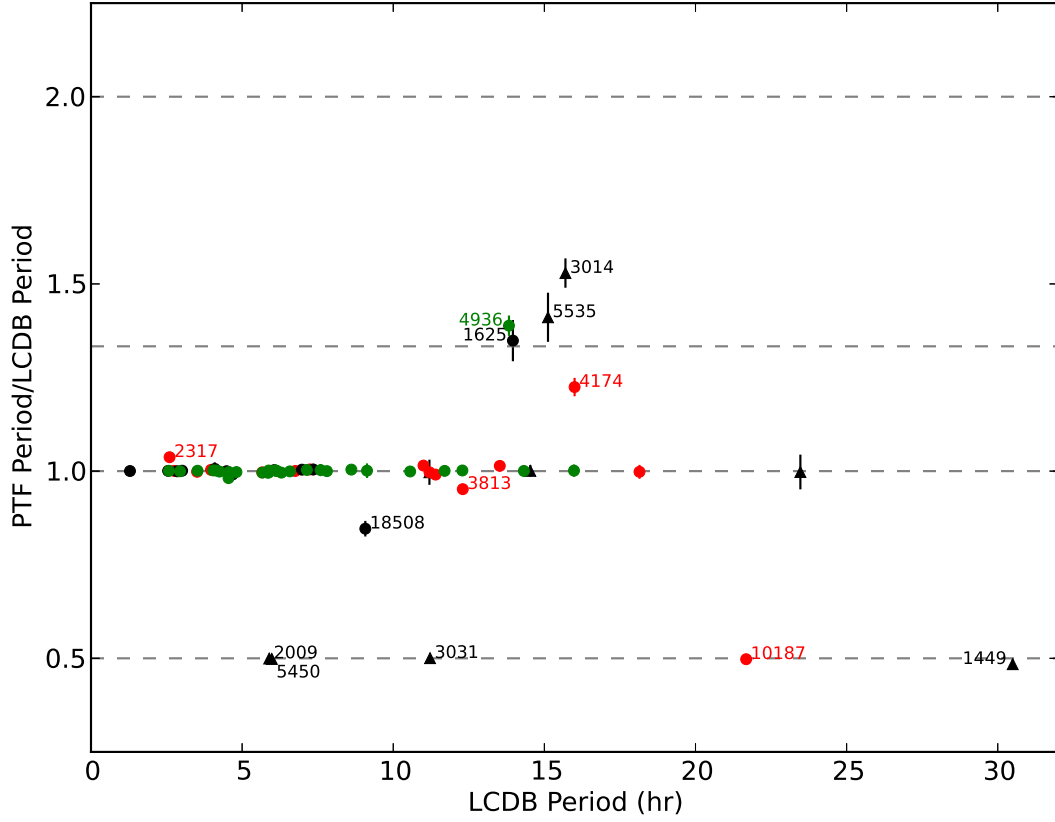


Fig. 5.— Comparison of 53 derived rotation periods for PTF-U2s with matching objects in the Asteroid Light Curve Database. Filled circles and filled triangles correspond to asteroids with full and partial rotational-phase coverages, respectively. Red, green, and black indicate U of the PTF-U2 is $>$, $=$, or $<$ U of the matching LCDB object, respectively.

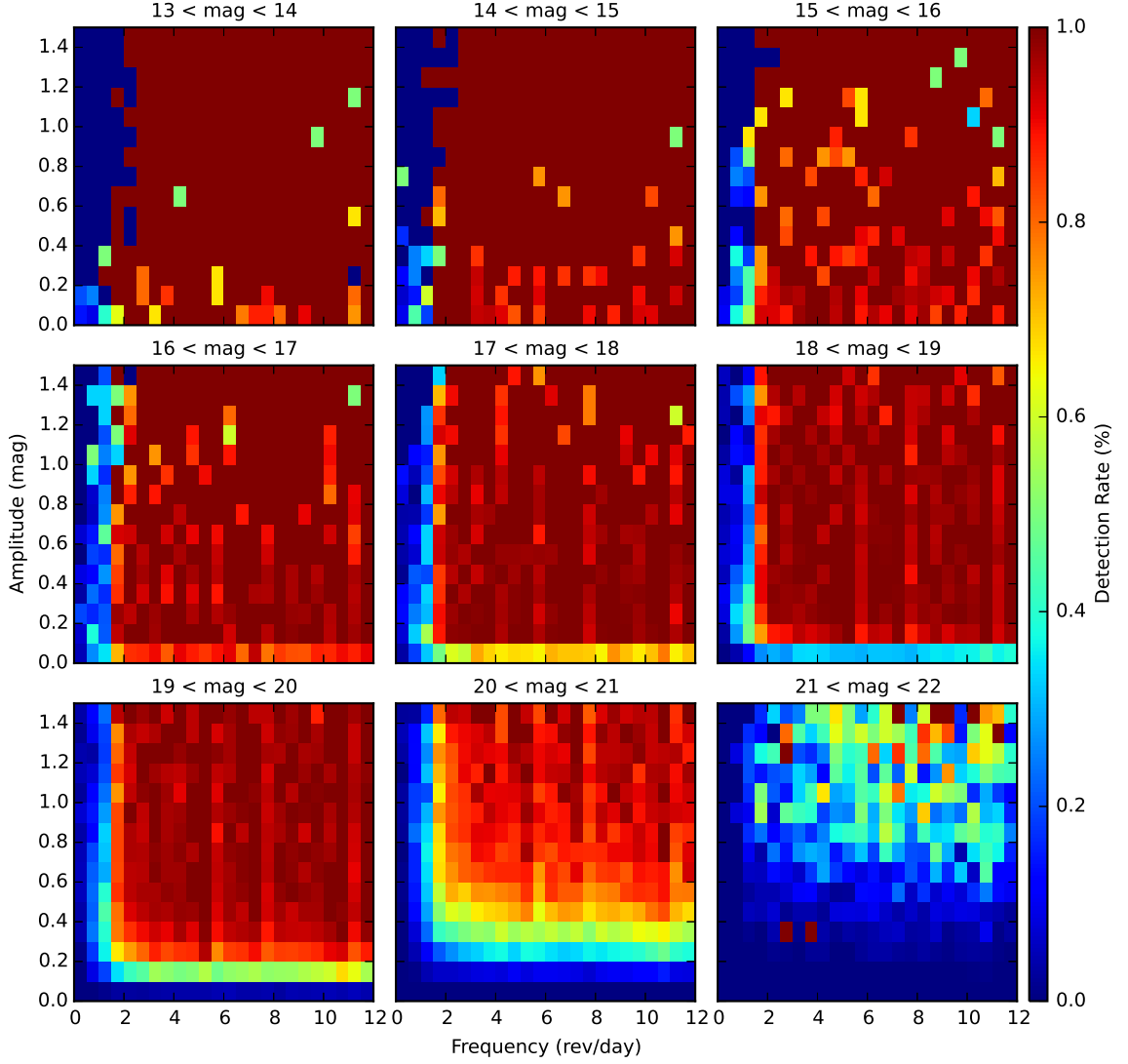


Fig. 6.— Detection rates for asteroid rotation period. The color bar scale on the right shows the percentage of successful recovery for rotation period of synthetic objects. The apparent magnitude interval is indicated on the top of each plot.

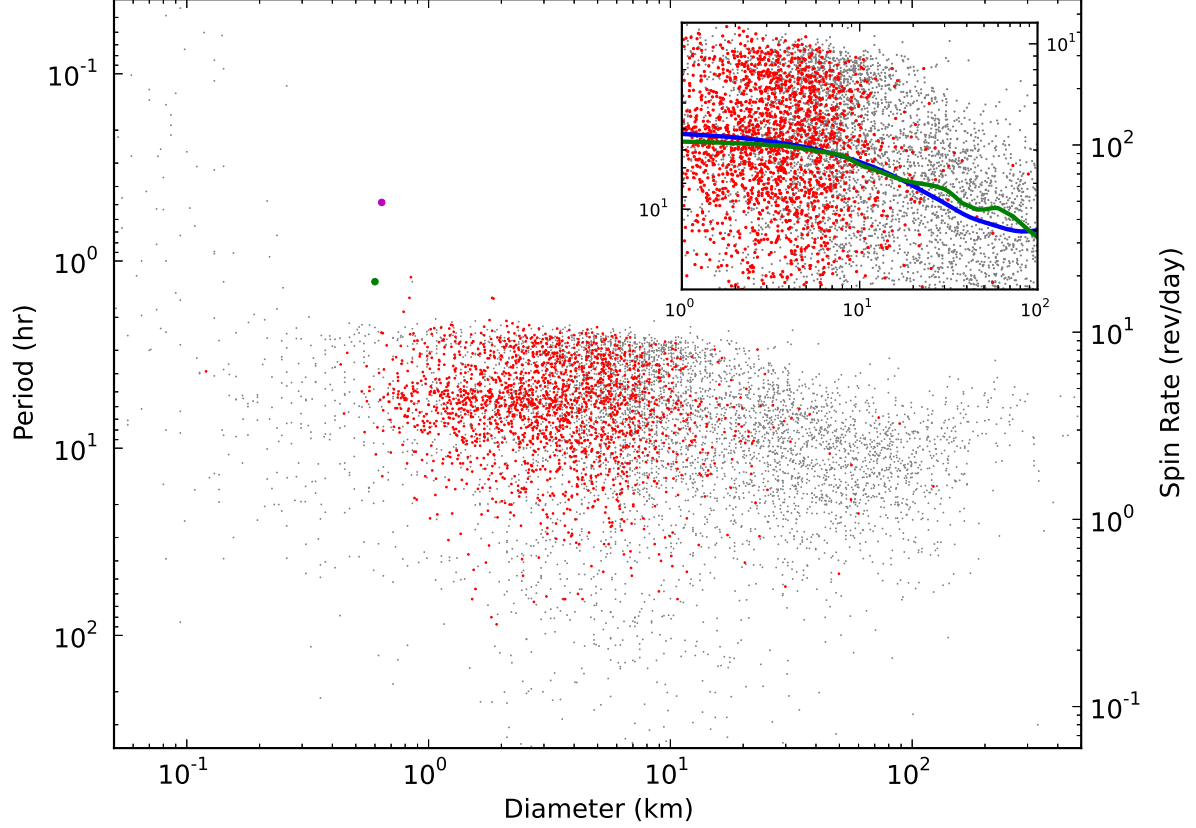


Fig. 7.— Asteroid rotation period vs. diameter. The red and gray filled circles are PTF-U2s and LCDB objects of $U \geq 2$, respectively. The SFRs, 2001 OE84 (magenta) and 2005 UW163 (green), are indicated with larger filled circles. The inset plot is a zoom-in of the dense region, where the green and blue lines are the regressions of the spin rates for PTF-U2s and LCDB objects computed using LOWESS, respectively.

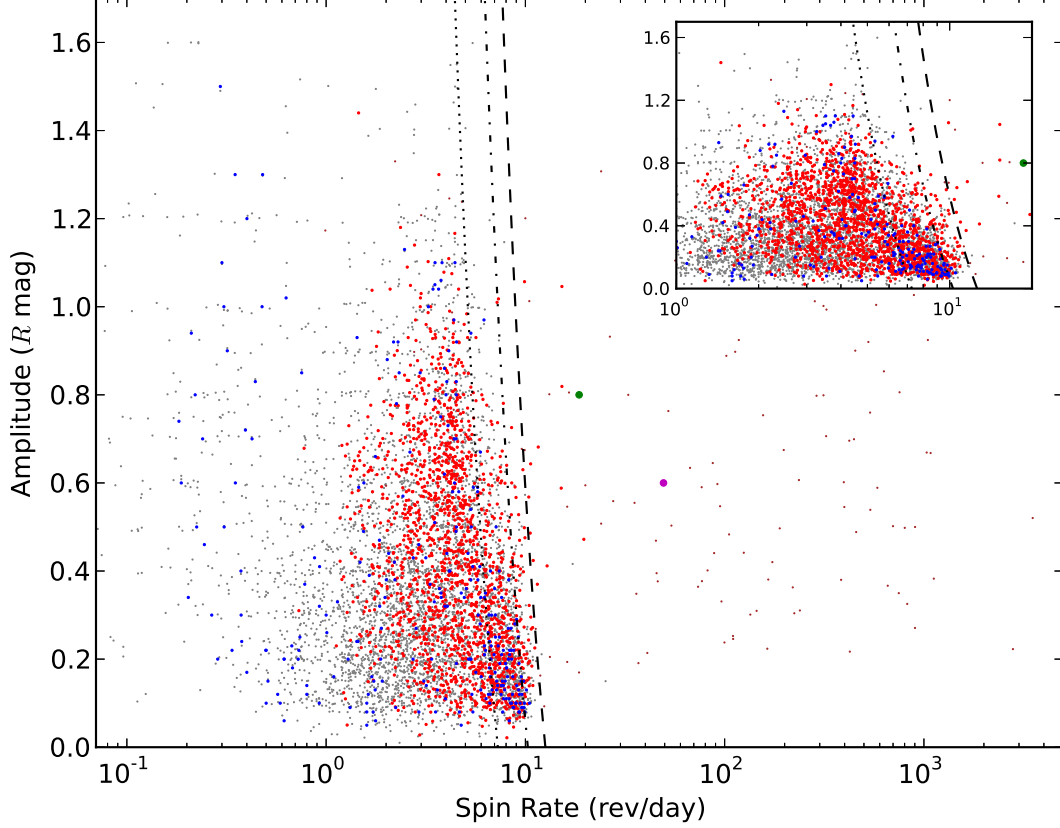


Fig. 8.— Lightcurve amplitude vs. spin rate. The red, gray, blue, and brown filled circles are PTF-U2s, LCDB of $D \geq 0.2$ km, P08 (update 2014-04-20), and LCDB of $D < 0.2$ km, respectively. The dashed, dot-dashed and dotted lines represent the spin-rate limits for rubble-pile asteroids with bulk densities of 3, 2, and 1 g/cm³ (Pravec & Harris 2000), respectively. The inset plot is a zoom-in of $1 < f < 12$ rev/day.

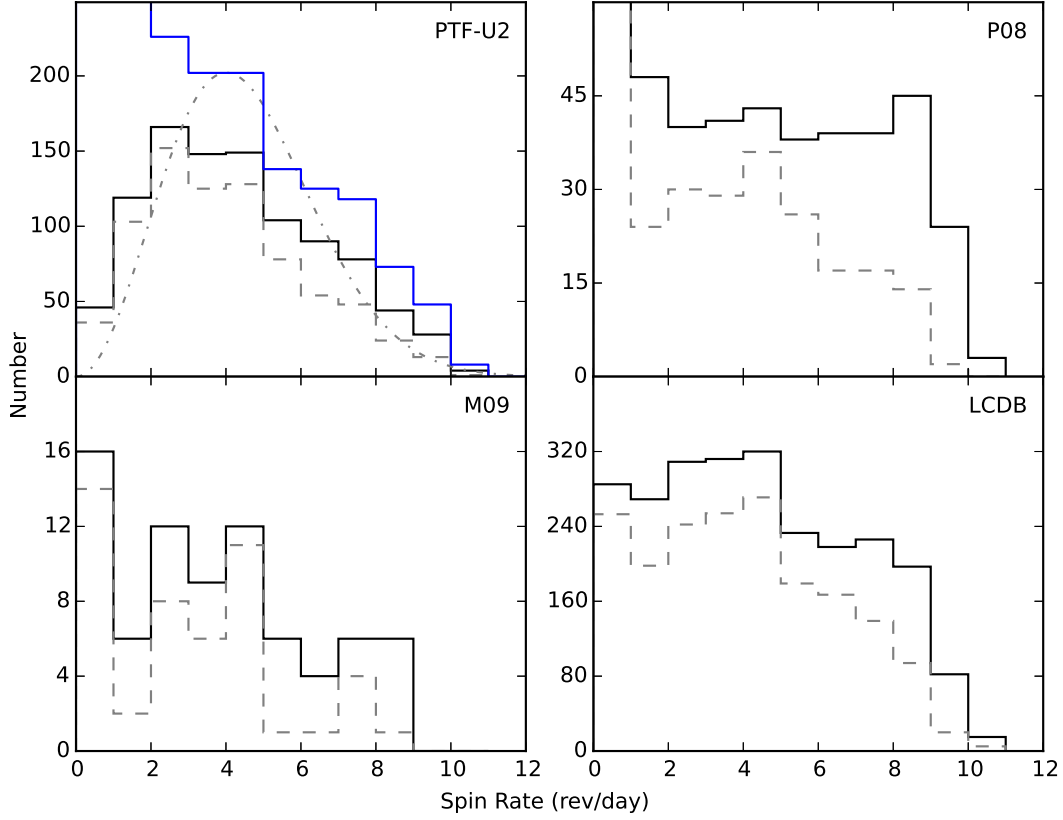


Fig. 9.— Spin-rate distributions of D3-15 asteroids for PTF-U2s, P08 (update 2014-04-20), M08 and LCDB. The gray dashed line are for asteroids of $\Delta m > 0.2$ mag, the gray dot-dashed line on the plot for PTF-U2s is the best-fit Maxwellian distribution and the blue line is debiased result for PTF-U2s. Note that P08 (update 2014-04-20) is not in full scale.

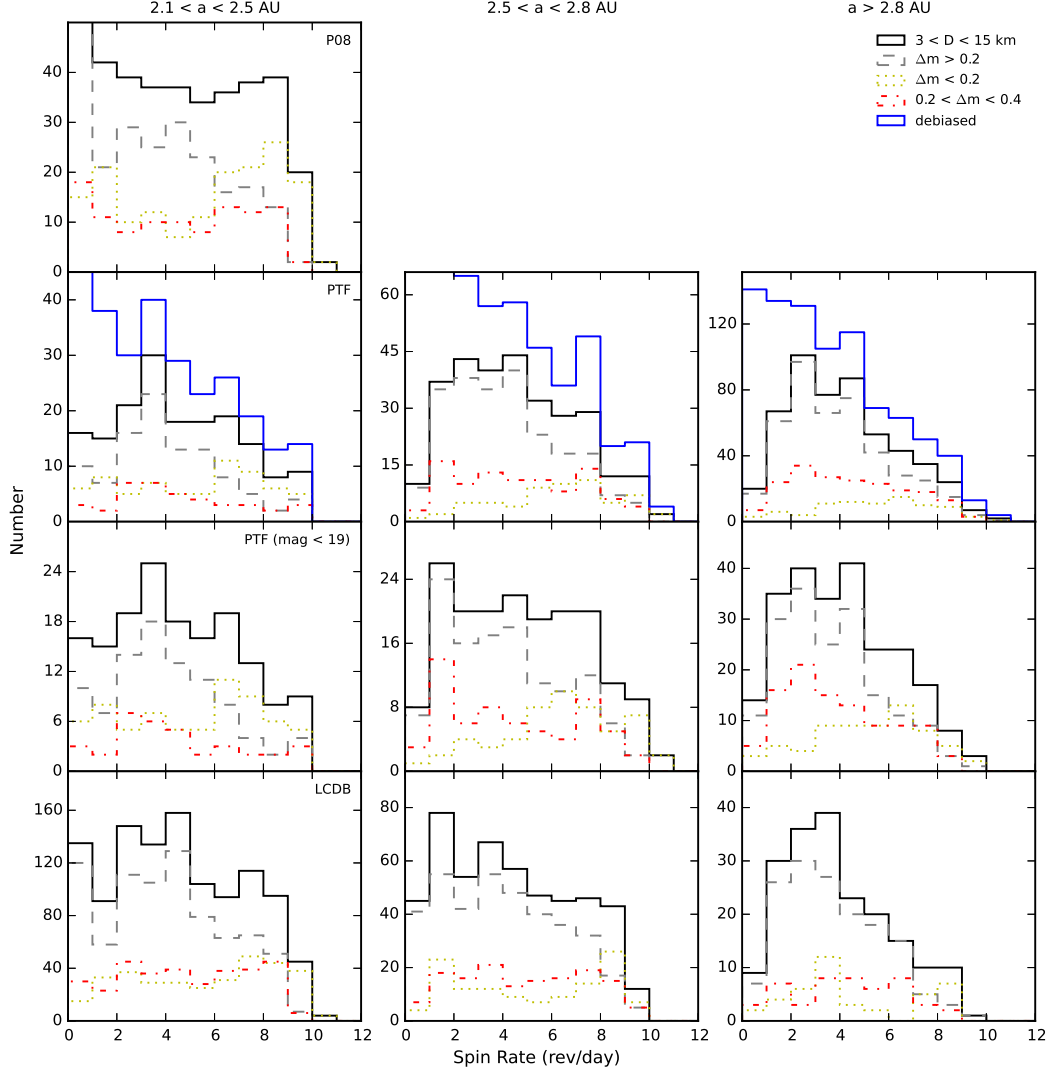


Fig. 10.— Spin-rate distributions of D3-15 asteroids (black line) in inner (left), mid (middle) and outer (right) main belts for P08 (update 2014-04-20; first row), PTF-U2s (second row), PTF-U2s with magnitude < 19 mag (third row) and LCDB (last row). The blue solid, gray dashed, yellow dotted and red dot-dashed lines represent debiased PTF-U2s, asteroids with $\Delta m > 0.2$, $\Delta m < 0.2$ and $0.2 < \Delta m < 0.4$ mag, respectively.

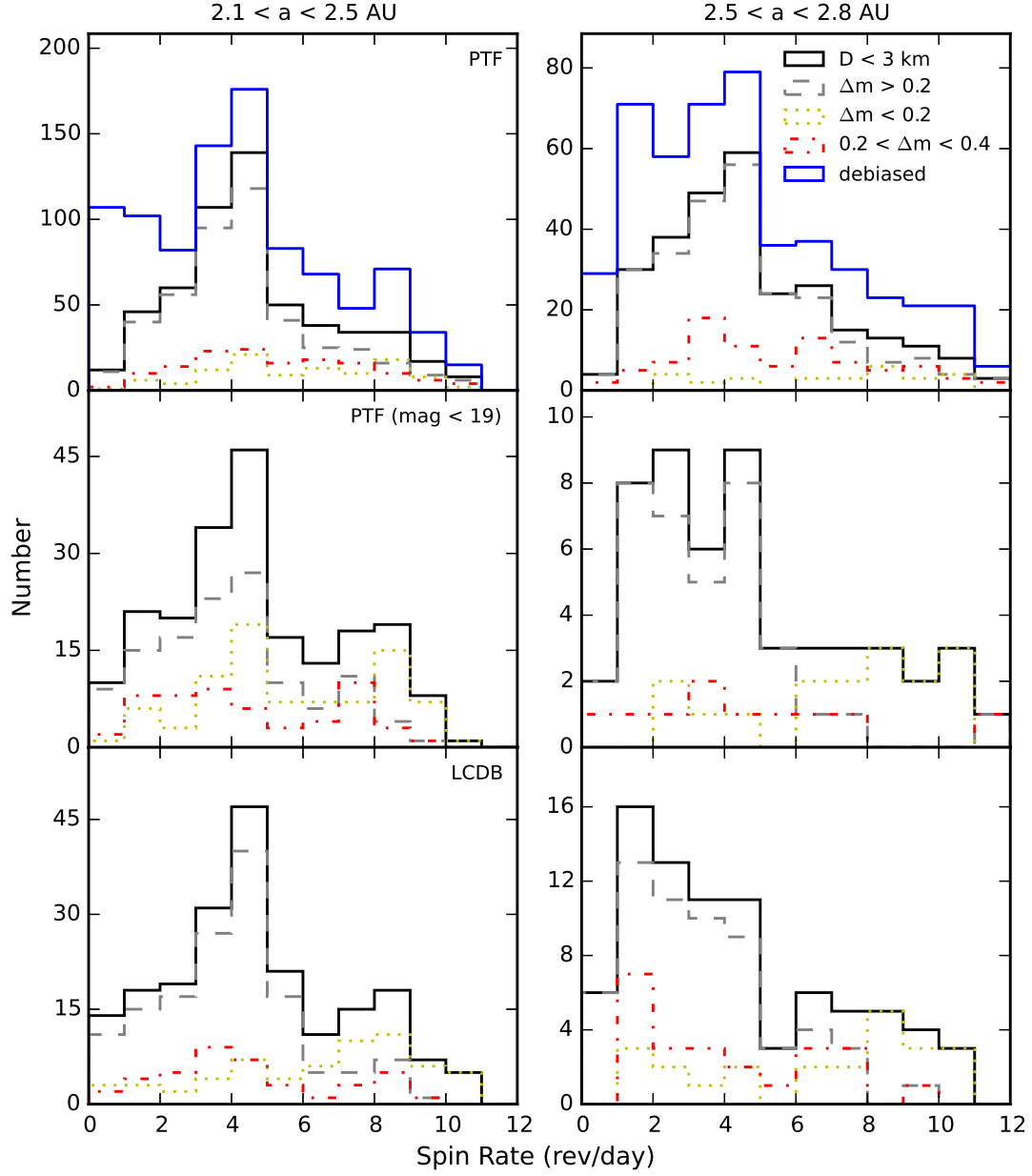


Fig. 11.— Spin-rate distributions of asteroids with $D < 3$ km. Same as Fig. 10.

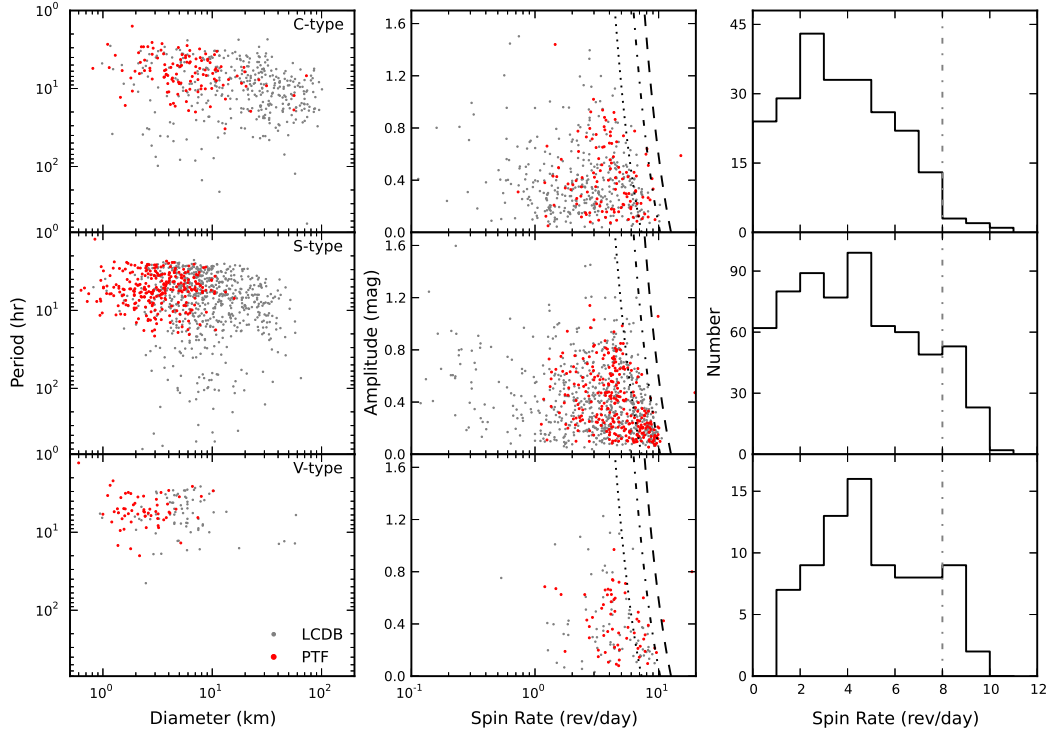


Fig. 12.— Asteroid rotation period vs. diameter (left), lightcurve amplitude vs. spin rate (middle), and spin-rate distribution (right) for C- (upper), S- (middle) and V-type (lower) asteroids. The gray and red filled circles are LCDB objects and PTF-U2s, respectively.

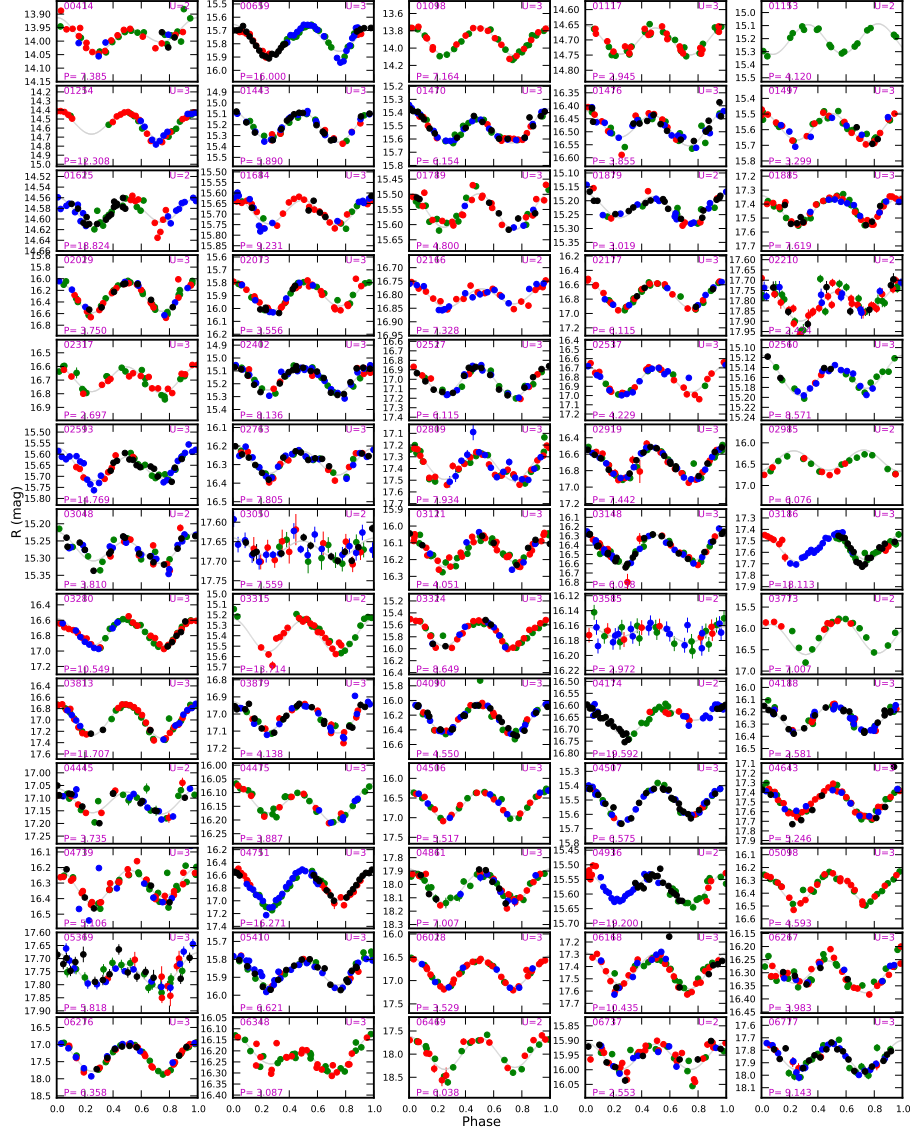


Fig. 13.— Set of 65 folded lightcurves for the PTF-U2 asteroids. The green, red, blue and black circles represent observation taken at different nights. The asteroid designation is given on each plot along with its derived rotation period P in hours and quality code U .

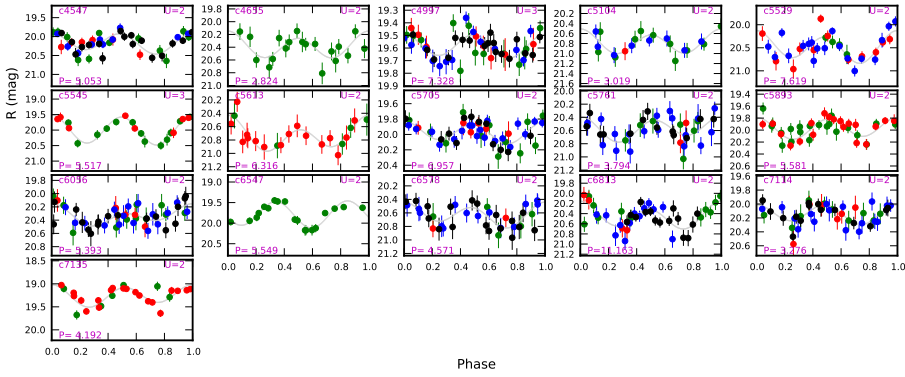


Fig. 14.— Same as Fig. 13 for other 15 PTF-U2 asteroids.

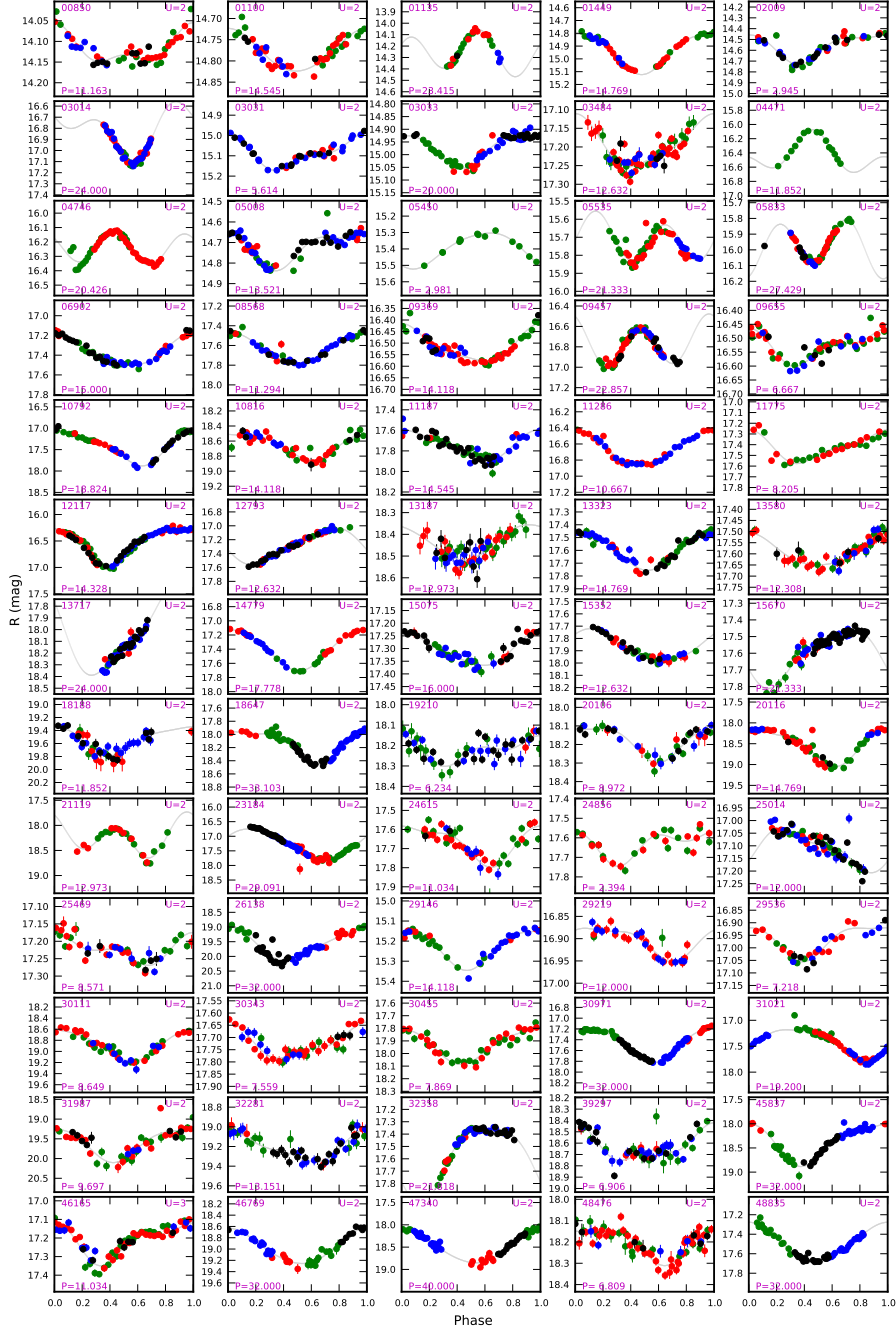


Fig. 15.— Same as Fig. 13 for other 65 PTF-P asteroids.

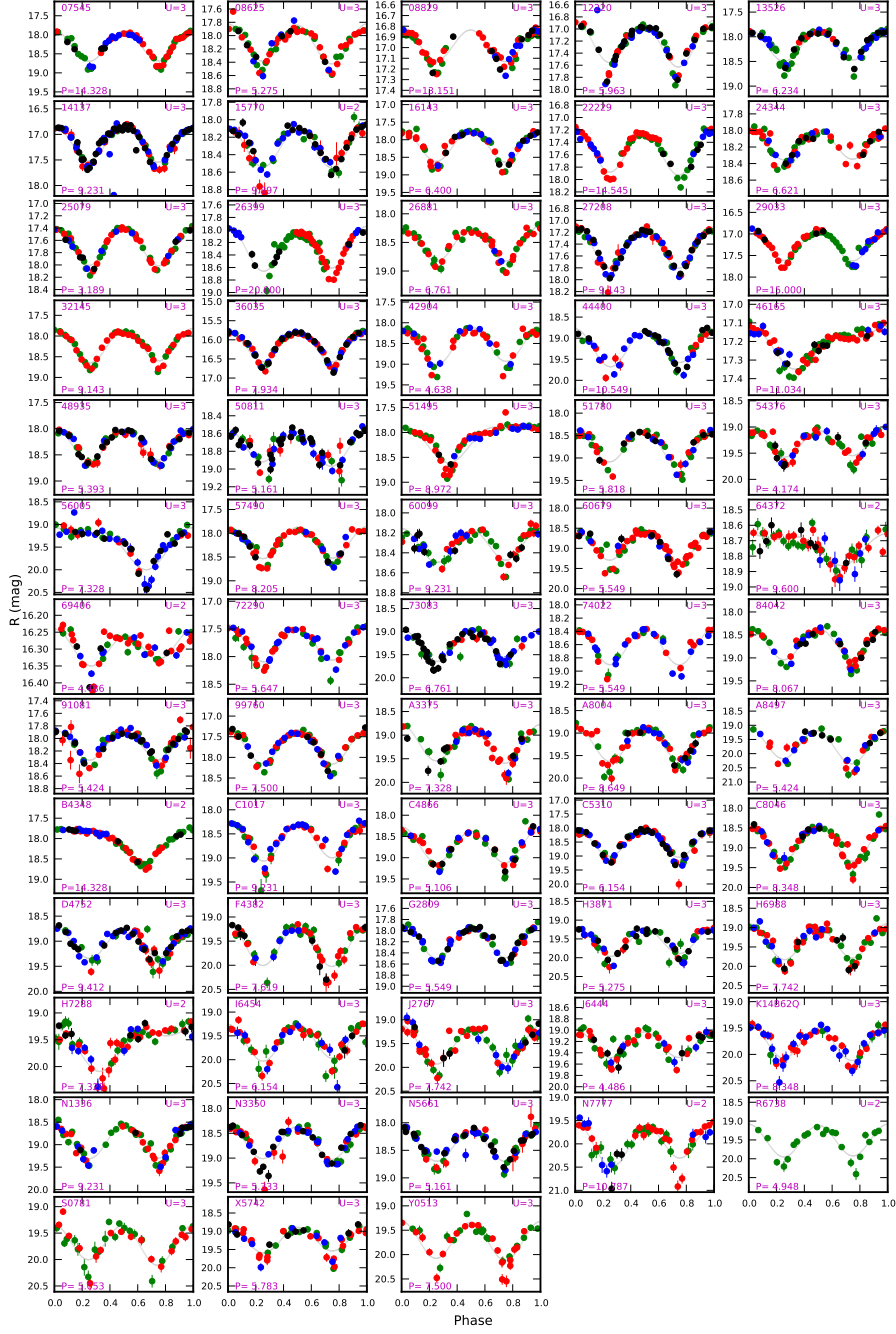


Fig. 16.— Same as Fig. 13 for 63 asteroids with large-amplitude lightcurves and a deep V-shape minima.

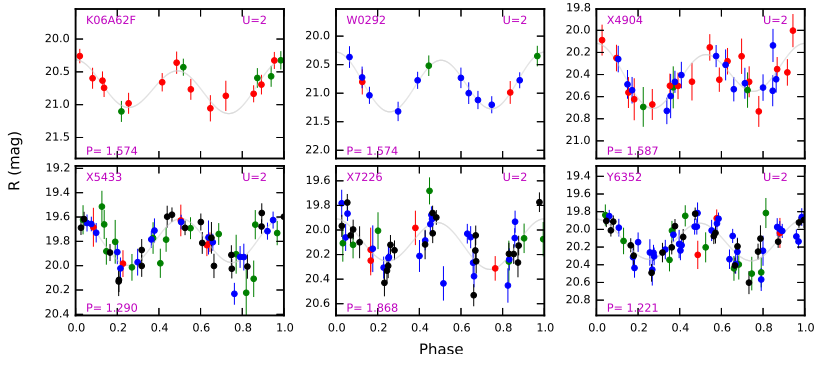


Fig. 17.— Same as Fig. 13 for 6 SFR candidates, in which X5433 has been confirmed its super-fast rotating.

Table 1. Survey observations in January 2014.

Field ID	RA	Dec.	Jan 6	Jan 7	Jan 8	Jan 9
	(°)	(°)	Δt , Nexp	Δt , Nexp	Δt , Nexp	Δt , Nexp
3559	117.00	19.12	9.6, 28	9.8, 30	5.1, 16	9.7, 12
3560	120.60	19.12	9.7, 29	9.8, 30	5.1, 16	9.7, 12
3561	124.20	19.12	9.3, 28	9.4, 29	5.5, 17	9.6, 11
3562	127.80	19.12	9.3, 28	9.1, 28	5.5, 17	8.2, 11
3563	131.40	19.12	9.2, 28	8.8, 27	5.1, 16	8.2, 9
3564	135.00	19.12	8.9, 27	8.7, 27	5.1, 16	8.2, 9
3565	138.60	19.12	8.5, 26	8.4, 26	5.1, 16	7.8, 8
3658	115.71	21.38	9.7, 29	9.8, 30	5.1, 16	9.7, 10
3659	119.39	21.38	9.7, 28	9.8, 30	5.1, 16	9.8, 10
3660	123.06	21.38	9.6, 29	9.4, 29	5.1, 16	10.0, 11
3661	126.73	21.38	9.3, 28	9.5, 29	5.1, 16	9.8, 10
3662	130.41	21.38	9.3, 28	9.1, 28	5.1, 16	7.8, 9

Field ID	RA	Dec.	Feb 20	Feb 21	Feb 22	Feb 23
	(°)	(°)	Δt , Nexp	Δt , Nexp	Δt , Nexp	Δt , Nexp
3158	143.65	10.12	7.9, 19	7.6, 22	7.9, 22	7.2, 20
3159	147.12	10.12	8.0, 17	7.3, 20	7.9, 21	7.7, 22
3160	150.58	10.12	7.6, 18	7.7, 21	7.7, 22	7.7, 22
3161	154.04	10.12	8.0, 20	8.0, 22	7.9, 23	7.9, 23
3162	157.50	10.12	8.3, 20	7.9, 22	8.0, 24	7.9, 23
3163	160.96	10.12	8.0, 19	7.8, 22	8.0, 24	8.0, 24
3261	141.55	12.38	7.7, 20	7.6, 21	8.2, 23	7.1, 20
3262	145.05	12.38	8.1, 20	7.9, 23	8.2, 23	7.5, 20
3263	148.54	12.38	8.2, 20	7.6, 22	8.1, 23	7.7, 21
3264	152.04	12.38	7.9, 20	8.0, 23	8.2, 24	8.2, 24
3265	155.53	12.38	8.7, 19	8.0, 22	8.1, 24	8.2, 23
3266	159.03	12.38	8.0, 21	8.2, 23	8.1, 25	8.2, 24

Note. — Δt is the time duration spanned by each observing set in hours and Nexp is the total number of exposures for each night and field.

Table 2. Synodic rotation periods of PTF-U2s.

Obj ID	Designation	a	e	i	Ω	ω	D	Δ	r	α	H_R	n	m	PTF_R	Period (hr)	Δm	U
00414*	(414) Liriope	3.52	0.07	9.56	110.6	322.7	88.8	3.32	2.35	3.38	9.22±0.12	4	81	13.99±0.00	7.38±0.11	0.14	2
00659*	(659) Nestor	5.19	0.11	4.52	350.9	342.0	122.3	5.78	4.79	0.70	8.47±0.13	4	89	15.78±0.00	16.00±0.26	0.22	3
01098*	(1098) Hakone	2.69	0.12	13.38	329.0	81.4	29.6	2.70	1.72	2.89	10.35±0.12	2	43	13.94±0.00	7.16±0.05	0.35	3
01117*	(1117) Reginita	2.25	0.20	4.34	147.1	151.1	10.2	2.58	1.60	1.03	11.47±0.07	2	48	14.70±0.00	2.94±0.01	0.11	3
01153*	(1153) Wallenbergia	2.20	0.16	3.34	280.6	28.9	9.9	2.52	1.54	3.64	12.04±0.10	1	22	15.22±0.00	4.12±0.07	0.23	2
01254*	(1254) Erfordia	3.14	0.03	7.07	288.0	239.4	56.1	3.08	2.10	1.88	10.23±0.12	3	68	14.58±0.00	12.31±0.16	0.33	3
01443*	(1443) Ruppina	2.94	0.06	1.93	174.9	163.7	17.2	3.12	2.14	2.33	10.97±0.12	4	85	15.21±0.00	5.89±0.04	0.27	3
01470*	(1470) Carla	3.16	0.07	3.21	358.5	342.5	34.1	3.37	2.38	0.89	10.80±0.12	4	107	15.49±0.00	6.15±0.04	0.24	3
01476	(1476) Cox	2.28	0.19	6.33	330.6	350.1	7.4	2.71	1.73	2.69	12.87±0.10	4	85	16.47±0.01	3.86±0.02	0.13	3
01497	(1497) Tampere	2.90	0.08	1.06	300.3	29.6	16.3	3.07	2.09	2.04	11.30±0.12	4	76	15.57±0.00	3.30±0.01	0.20	3
01625*	(1625) The NORC	3.19	0.23	15.55	320.8	285.9	55.9	3.17	2.19	3.56	10.07±0.08	4	100	14.58±0.00	18.82±0.77	0.06	2
01684	(1684) Iguassu	3.10	0.12	3.67	105.4	153.0	31.4	3.36	2.42	5.73	10.70±0.14	4	86	15.68±0.00	9.23±0.17	0.15	3
01789*	(1789) Dobrovolsky	2.21	0.19	1.98	102.1	214.9	7.8	2.60	1.66	7.75	11.80±0.08	4	72	15.55±0.00	4.80±0.02	0.11	3
01879*	(1879) Broederstroom	2.25	0.15	1.72	250.0	174.1	7.0	2.17	1.18	4.02	12.78±0.10	4	74	15.23±0.00	3.02±0.01	0.12	2
01885	(1885) Herero	2.25	0.25	5.66	326.4	5.6	4.7	2.68	1.74	7.78	13.56±0.14	4	78	17.44±0.01	7.62±0.06	0.23	3
02029	(2029) Binomi	2.35	0.13	5.59	278.1	67.4	7.0	2.51	1.53	3.91	13.03±0.21	4	82	16.30±0.01	3.75±0.01	0.51	3
02073	(2073) Janacek	2.72	0.11	2.96	85.1	0.6	9.8	2.44	1.48	6.01	12.65±0.11	4	78	15.89±0.00	3.56±0.01	0.24	3
02166	(2166) Handahl	2.35	0.22	5.13	163.9	136.7	4.3	2.77	1.79	3.11	13.03±0.08	3	49	16.80±0.01	7.33±0.11	0.11	2
02177*	(2177) Oliver	3.20	0.10	1.53	51.7	273.9	19.8	3.47	2.51	4.16	11.68±0.16	4	76	16.74±0.01	6.11±0.04	0.44	3
02210	(2210) Lois	2.41	0.23	2.93	123.5	216.0	4.5	2.75	1.80	6.17	13.95±0.15	4	77	17.78±0.02	2.42±0.01	0.16	2
02317*	(2317) Galya	2.52	0.17	4.17	187.3	204.6	9.5	2.65	1.67	3.42	13.12±0.08	2	42	16.70±0.01	2.70±0.02	0.22	3
02402	(2402) Satpaev	2.22	0.13	5.17	337.8	64.4	7.2	2.29	1.30	0.62	12.73±0.10	4	109	15.17±0.00	8.14±0.07	0.23	3
02527*	(2527) Gregory	2.47	0.19	2.61	186.3	178.0	5.7	2.80	1.82	2.88	13.22±0.13	4	75	17.01±0.01	6.11±0.04	0.31	3
02537	(2537) Gilmore	2.66	0.17	12.93	335.0	19.1	7.2	3.06	2.07	1.53	12.65±0.12	3	63	16.82±0.01	4.23±0.02	0.34	3
02560	(2560) Sieigma	2.75	0.04	5.94	148.4	283.4	18.5	2.73	1.74	0.93	11.68±0.08	4	75	15.16±0.00	8.57±0.08	0.07	3
02593	(2593) Buryatia	2.17	0.08	0.21	63.6	76.0	4.3	2.00	1.01	2.37	13.84±0.12	4	86	15.64±0.00	14.77±0.23	0.16	3
02763*	(2763) Jeans	2.40	0.22	3.54	308.8	34.0	7.5	2.89	1.92	4.11	12.32±0.09	4	82	16.29±0.01	7.80±0.06	0.18	3
02809	(2809) Vernadskij	2.43	0.18	2.47	357.3	348.7	12.0	2.71	1.79	9.21	13.38±0.14	3	68	17.34±0.01	7.93±0.07	0.27	3
02919	(2919) Dali	3.14	0.15	1.43	161.3	123.4	19.2	3.44	2.45	1.79	11.90±0.15	4	83	16.72±0.01	7.44±0.06	0.38	3
02985*	(2985) Shakespeare	2.85	0.04	2.65	34.3	277.2	10.5	2.97	2.06	8.59	11.93±0.24	2	23	16.55±0.01	6.08±0.04	0.39	2
03048	(3048) Guangzhou	2.40	0.15	1.94	214.3	266.8	6.8	2.07	1.10	6.40	13.08±0.09	4	79	15.27±0.00	3.81±0.02	0.10	2
03050	(3050) Carrera	2.23	0.19	1.31	240.0	85.2	3.6	2.64	1.66	1.43	14.24±0.10	4	77	17.67±0.02	7.56±0.17	0.08	2

Table 2—Continued

Obj ID	Designation	a	e	i	Ω	ω	D	Δ	r	α	H_R	n	m	PTF_R	Period (hr)	Δm	U
03121*	(3121) Tamines	2.23	0.09	6.36	125.5	87.6	6.1	2.24	1.27	5.39	13.45±0.11	4	87	16.13±0.01	4.05±0.02	0.18	3
03148	(3148) Grechko	3.10	0.19	0.73	0.9	44.3	18.3	3.14	2.16	1.40	12.19±0.13	4	77	16.42±0.01	6.04±0.04	0.35	3
03186*	(3186) Manuilova	3.11	0.18	0.80	170.0	205.5	13.9	3.48	2.49	0.64	12.78±0.11	4	81	17.57±0.02	18.11±0.34	0.27	3
03280*	(3280) Gretry	2.58	0.18	2.23	317.2	0.4	8.8	3.02	2.09	7.25	12.29±0.17	4	79	16.76±0.01	10.55±0.12	0.43	3
03315	(3315) Chant	2.64	0.08	10.03	146.7	58.5	14.7	2.48	1.50	3.03	12.17±0.10	2	41	15.34±0.00	13.71±0.20	0.29	2
03324*	(3324) Avsyuk	2.70	0.03	10.76	316.8	178.0	21.0	2.63	1.73	10.54	11.86±0.18	4	70	15.75±0.00	8.65±0.08	0.50	3
03585	(3585) Goshirakawa	3.08	0.18	3.02	162.9	14.0	15.3	2.57	1.59	3.18	12.84±0.07	3	61	16.17±0.01	2.97±0.04	0.04	2
03773*	(3773) Smithsonian	2.17	0.18	1.33	63.5	286.9	8.0	2.37	1.42	8.21	12.51±0.25	2	25	15.90±0.01	7.01±0.05	0.33	2
03813*	(3813) Fortov	2.19	0.18	4.16	319.9	349.5	5.1	2.57	1.63	7.99	13.56±0.19	4	79	16.98±0.01	11.71±0.14	0.53	3
03879*	(3879) Machar	2.36	0.26	8.66	322.1	32.0	5.7	2.89	1.90	1.17	13.22±0.14	4	74	17.02±0.01	4.14±0.02	0.19	3
04090	(4090) Risehvezd	2.36	0.21	1.33	266.6	4.3	7.2	2.52	1.54	1.87	13.08±0.16	4	80	16.25±0.01	4.55±0.02	0.41	3
04174*	(4174) Pikulia	3.18	0.14	2.32	127.0	173.5	22.5	3.51	2.52	1.69	11.72±0.09	4	84	16.66±0.01	19.59±0.39	0.12	2
04188	(4188) Kitezh	2.34	0.15	6.12	136.3	228.2	6.6	2.63	1.64	1.72	12.88±0.13	4	89	16.24±0.01	2.58±0.01	0.27	3
04445	(4445) Jimstratton	2.27	0.19	2.86	215.6	156.5	4.3	2.52	1.54	4.23	13.87±0.07	4	76	17.12±0.01	3.74±0.01	0.13	2
04475	(4475) Voitkevich	2.25	0.07	2.20	336.6	151.0	5.3	2.10	1.16	10.34	13.53±0.15	3	49	16.14±0.01	3.89±0.02	0.12	3
04506	(4506) Hendrie	2.89	0.01	3.01	63.8	161.3	8.8	2.89	1.95	6.51	12.33±0.26	3	41	16.68±0.01	5.52±0.03	0.76	3
04507*	(4507) 1990 FV	2.87	0.01	2.66	47.5	77.6	11.0	2.84	1.86	1.92	11.70±0.11	4	87	15.52±0.00	6.58±0.05	0.22	3
04643	(4643) Cisneros	2.37	0.20	1.78	106.8	188.0	5.7	2.83	1.88	6.12	13.39±0.16	4	83	17.50±0.02	5.25±0.03	0.33	3
04739	(4739) Tomahrens	2.74	0.07	1.75	172.7	270.7	7.0	2.58	1.61	4.25	12.91±0.11	4	85	16.32±0.01	5.11±0.03	0.21	3
04751	(4751) Alicemanning	3.17	0.17	2.61	136.7	130.3	17.8	3.34	2.36	1.50	12.20±0.17	4	81	16.78±0.01	16.27±0.27	0.49	3
04861	(4861) Nemirovskij	2.90	0.22	3.54	96.9	233.7	6.6	3.43	2.50	6.35	12.95±0.14	4	78	18.02±0.02	7.01±0.05	0.25	3
04936*	(4936) Butakov	2.28	0.13	5.91	155.8	284.0	4.9	2.16	1.17	0.70	13.40±0.08	4	94	15.58±0.00	19.20±0.38	0.11	2
05098	(5098) 1985 CH2	2.57	0.07	9.64	153.2	326.6	5.6	2.42	1.43	2.32	13.43±0.13	2	47	16.35±0.01	4.59±0.02	0.23	3
05369*	(5369) Virgiugum	2.26	0.23	4.53	166.8	181.4	4.5	2.72	1.74	3.65	13.98±0.10	4	84	17.75±0.02	5.82±0.04	0.13	3
05410	(5410) Spivakov	3.00	0.28	4.02	141.3	339.2	11.8	2.25	1.26	1.89	13.40±0.13	4	97	15.87±0.00	6.62±0.05	0.18	3
06028	(6028) 1994 ER1	2.58	0.17	6.75	301.0	309.7	7.4	2.86	1.88	3.92	12.95±0.23	3	65	16.83±0.01	3.53±0.01	0.64	3
06168	(6168) Isnello	3.17	0.06	2.57	133.9	89.7	10.3	3.22	2.26	4.32	12.73±0.12	4	82	17.44±0.02	10.43±0.11	0.27	3
06267	(6267) Rozhen	2.16	0.09	2.10	136.8	315.7	3.5	1.98	1.01	7.39	14.27±0.12	4	83	16.30±0.01	3.98±0.02	0.12	3
06276	(6276) Kurohone	2.88	0.05	1.44	298.5	30.1	7.0	3.00	2.05	6.43	12.96±0.30	4	82	17.38±0.01	6.36±0.04	0.87	3
06348	(6348) 1995 CH1	2.45	0.14	4.93	313.1	96.7	4.7	2.30	1.36	9.68	13.14±0.04	2	54	16.22±0.01	3.09±0.02	0.15	3
06469	(6469) Armstrong	2.22	0.20	3.96	159.4	150.7	3.7	2.65	1.67	4.27	14.34±0.25	2	37	18.00±0.02	6.04±0.04	0.65	2
06737*	(6737) Okabayashi	2.33	0.13	0.81	53.4	67.6	4.6	2.04	1.08	9.30	13.66±0.13	4	74	15.96±0.00	2.55±0.01	0.11	2

Table 2—Continued

Obj ID	Designation	a	e	i	Ω	ω	D	Δ	r	α	H_R	n	m	PTF_R	Period (hr)	Δm	U
06777	(6777) Balakirev	3.17	0.23	2.70	126.4	272.8	12.2	3.38	2.40	2.11	13.05±0.15	4	88	17.85±0.02	9.14±0.09	0.26	3
06793	(6793) Palazzolo	2.68	0.16	4.93	106.4	46.0	9.9	2.32	1.36	6.88	13.52±0.11	4	76	16.51±0.01	6.19±0.04	0.16	2
06795	(6795) Ornskoldsvik	2.64	0.12	5.06	133.9	193.6	6.1	2.97	1.98	0.96	13.45±0.12	3	49	17.43±0.02	13.71±0.19	0.37	2
07007	(7007) Timjull	2.40	0.15	0.73	349.3	263.8	2.6	2.66	1.69	4.32	14.95±0.09	2	54	18.56±0.03	3.54±0.03	0.31	2
07028	(7028) Tachikawa	2.88	0.07	3.12	116.8	212.9	7.3	3.02	2.05	2.84	12.77±0.14	4	97	16.98±0.01	10.43±0.11	0.24	3
07142	(7142) Spinoza	3.17	0.11	0.33	114.2	114.2	21.7	3.25	2.30	5.07	12.60±0.22	4	84	17.49±0.01	12.47±0.16	0.61	3
07203	(7203) Sigeki	2.44	0.16	2.56	325.3	202.9	5.9	2.05	1.07	0.95	13.06±0.13	4	85	14.89±0.00	11.29±0.13	0.33	3
07216	(7216) Ishkov	2.16	0.18	2.02	277.6	20.5	3.3	2.48	1.50	4.66	14.29±0.09	4	78	17.52±0.02	10.91±0.25	0.13	2
07271	(7271) Doroguntsov	3.11	0.27	2.99	318.7	60.2	7.8	3.08	2.15	7.16	13.32±0.13	4	72	17.97±0.02	4.02±0.03	0.20	2
07348	(7348) 1993 FJ22	3.09	0.11	0.87	11.1	151.0	15.7	2.83	1.89	6.71	12.78±0.05	2	54	16.89±0.01	3.47±0.02	0.13	2
07456	(7456) Doressoundiram	2.63	0.30	14.78	119.9	203.8	8.6	3.28	2.33	5.13	12.94±0.18	4	76	17.88±0.02	15.00±0.24	0.35	3
07484	(7484) Dogo Onsen	2.41	0.04	7.05	116.7	96.5	4.0	2.41	1.45	5.78	14.37±0.19	4	61	17.64±0.02	5.52±0.03	0.53	3
07545 ^b	(7545) Smaklosa	2.26	0.23	6.52	114.9	199.9	4.1	2.73	1.76	3.89	14.65±0.30	4	78	18.41±0.03	14.33±0.22	0.92	3
07696	(7696) Liebe	2.72	0.03	3.65	115.1	344.7	5.0	2.64	1.69	6.51	13.91±0.19	4	84	17.52±0.02	13.91±0.20	0.43	3
07742	(7742) Altamira	2.72	0.08	4.15	124.9	294.2	6.1	2.72	1.73	1.23	13.57±0.09	4	85	16.93±0.01	2.70±0.01	0.11	2
07846	(7846) Setvak	2.35	0.18	3.46	291.3	223.9	3.0	2.00	1.04	9.21	14.49±0.05	2	54	16.67±0.01	2.62±0.01	0.14	3
07923	(7923) Chyba	2.89	0.09	3.27	97.2	328.1	6.0	2.72	1.77	6.94	12.88±0.09	4	76	16.86±0.01	5.75±0.03	0.19	3
07966	(7966) Richardbaum	2.37	0.18	3.26	97.7	161.0	3.8	2.62	1.71	10.45	13.83±0.26	2	17	17.91±0.03	5.16±0.03	0.87	2
07979	(7979) Pozharskij	2.85	0.08	6.76	343.0	36.8	11.5	2.99	2.00	0.90	13.63±0.10	2	30	17.67±0.02	3.68±0.01	0.16	2
08057	(8057) Hofmannsthal	2.86	0.03	4.40	158.7	105.8	8.2	2.90	1.91	2.73	13.10±0.11	4	83	17.07±0.01	5.65±0.03	0.10	3
08225	(8225) Emerson	2.99	0.23	1.54	136.8	201.5	7.1	3.37	2.40	2.24	13.85±0.16	4	73	18.75±0.05	5.25±0.03	0.42	3
08261	(8261) Ceciliejulie	3.05	0.18	1.38	359.3	320.1	11.1	3.53	2.57	4.27	13.17±0.14	4	96	18.32±0.03	13.91±0.20	0.43	3
08316	(8316) Wolkenstein	3.00	0.12	9.55	294.5	52.9	15.9	3.18	2.20	2.46	11.58±0.16	4	79	16.03±0.01	4.57±0.02	0.40	3
08423	(8423) Macao	3.13	0.25	2.39	144.9	242.6	10.6	3.35	2.37	2.28	13.52±0.12	3	54	18.31±0.03	5.78±0.07	0.29	2
08535	(8535) Pellesvanslos	3.17	0.15	0.59	194.8	115.3	11.1	3.62	2.64	2.02	13.31±0.27	4	81	18.45±0.03	5.71±0.03	0.76	3
08575	(8575) Seishitakeuchi	2.22	0.22	4.01	295.6	37.3	3.0	2.52	1.54	2.49	14.62±0.14	4	79	17.80±0.02	5.27±0.03	0.43	3
08625 ^b	(8625) 1981 EX15	2.61	0.08	3.63	326.6	58.7	3.7	2.60	1.64	6.25	14.58±0.18	4	77	18.16±0.03	5.27±0.03	0.53	3
08649	(8649) Juglans	2.21	0.11	5.90	145.1	135.9	2.8	2.35	1.36	0.98	14.65±0.11	3	59	17.39±0.02	6.04±0.04	0.18	2
08829 ^b	(8829) 1988 RV10	3.22	0.11	2.88	148.2	33.0	14.3	3.05	2.08	4.00	12.65±0.13	4	82	17.00±0.01	13.15±0.18	0.33	3
08866	(8866) Tanegashima	3.12	0.17	11.64	316.8	109.9	21.6	2.94	1.96	3.29	12.07±0.11	4	71	16.17±0.01	13.71±0.19	0.27	3
08906*	(8906) Yano	3.20	0.20	1.39	146.9	267.8	14.1	3.20	2.21	1.16	12.59±0.10	3	86	17.20±0.01	6.76±0.09	0.13	3
08952	(8952) ODAS	2.60	0.06	2.25	49.8	201.8	4.8	2.70	1.75	6.53	13.81±0.16	3	73	17.78±0.02	3.00±0.01	0.36	3

Table 2—Continued

Obj ID	Designation	a	e	i	Ω	ω	D	Δ	r	α	H_R	n	m	PTF_R	Period (hr)	Δm	U
08965	(8965) Citrinella	3.16	0.14	0.87	160.1	110.7	12.6	3.34	2.35	1.39	12.98±0.15	4	85	17.63±0.02	9.06±0.09	0.32	3
08978	(8978) Barbatus	3.23	0.09	0.29	354.5	214.0	9.1	3.23	2.26	3.03	13.72±0.11	4	73	18.13±0.03	7.27±0.11	0.15	3
09036	(9036) 1990 SJ16	3.10	0.22	5.17	296.9	75.4	6.0	3.08	2.10	3.03	13.40±0.22	4	63	17.75±0.02	2.57±0.01	0.53	3
09237	(9237) 1997 GY7	2.68	0.12	1.61	95.8	14.8	4.5	2.44	1.45	2.23	14.01±0.21	4	87	16.78±0.01	4.09±0.02	0.61	3
09243	(9243) 1998 FF68	3.12	0.10	0.04	269.1	291.7	9.1	2.90	1.91	1.76	13.48±0.10	4	83	17.53±0.02	4.21±0.02	0.17	3
09274	(9274) Amylovell	2.63	0.16	6.80	350.7	250.2	5.6	2.54	1.55	1.92	14.70±0.21	4	85	17.90±0.02	5.49±0.03	0.71	3
09563	(9563) Kitty	2.36	0.22	1.57	202.6	150.9	3.3	2.52	1.55	4.41	14.91±0.25	3	70	17.99±0.03	5.36±0.03	0.72	3
09630	(9630) Castellion	2.78	0.16	2.80	329.8	340.6	6.8	3.20	2.26	6.31	13.00±0.12	4	58	17.76±0.02	2.56±0.03	0.10	2
09792	(9792) 1996 BX1	2.36	0.15	11.20	113.3	359.4	8.3	2.00	1.02	3.02	13.93±0.21	3	41	15.66±0.00	6.32±0.04	0.26	3
09847	(9847) 1990 QJ5	2.38	0.21	2.74	19.6	0.2	3.1	2.68	1.69	1.67	14.51±0.11	4	83	17.99±0.02	2.77±0.01	0.27	3
09884	(9884) Pribram	2.38	0.14	1.86	25.5	74.6	4.7	2.16	1.17	1.92	15.52±0.14	4	89	17.58±0.02	14.12±0.20	0.41	3
09916	(9916) Kibirev	2.85	0.09	1.02	288.2	80.1	6.2	3.04	2.05	0.85	13.16±0.17	4	78	17.19±0.01	15.48±0.25	0.45	3
09931	(9931) Herbhauptman	2.38	0.18	2.47	157.2	80.6	5.2	2.31	1.33	4.32	13.66±0.09	3	62	16.46±0.01	4.44±0.02	0.15	3
09948*	(9948) 1990 QB2	2.39	0.22	2.09	171.6	151.5	3.3	2.80	1.83	3.75	14.29±0.20	4	76	18.14±0.03	3.53±0.01	0.60	3
09999	(9999) Wiles	2.84	0.07	3.20	76.4	235.2	7.1	3.02	2.03	1.84	12.89±0.08	2	38	17.03±0.01	3.47±0.02	0.13	2
10025	(10025) Rauer	2.91	0.07	1.24	313.7	95.2	8.2	2.80	1.82	2.10	12.69±0.20	4	73	16.44±0.01	4.44±0.02	0.48	3
10187*	(10187) 1996 JV	2.41	0.19	24.10	118.4	156.8	6.2	2.81	1.86	6.08	12.97±0.16	4	57	16.96±0.01	10.79±0.25	0.20	3
10231	(10231) 1997 WQ37	2.97	0.06	4.20	106.6	287.9	5.2	2.94	1.98	5.18	13.33±0.10	4	74	17.54±0.02	3.37±0.01	0.20	3
10378	(10378) Ingmarbergman	2.92	0.03	1.17	267.3	55.7	6.0	2.99	2.00	0.70	13.38±0.09	2	46	17.45±0.01	4.53±0.06	0.14	2
10449	(10449) Takuma	3.07	0.33	2.53	162.0	183.3	12.6	3.99	3.00	1.68	12.94±0.16	4	81	18.55±0.04	7.33±0.06	0.46	3
10883	(10883) 1996 VU5	3.13	0.18	2.22	137.0	279.7	9.2	2.76	1.78	2.48	13.51±0.24	2	27	17.15±0.02	5.36±0.03	0.32	2
11141	(11141) Jindrawalter	2.60	0.33	13.04	113.7	210.7	6.1	3.34	2.40	5.97	14.09±0.27	2	19	19.25±0.07	5.89±0.11	0.65	2
11174	(11174) Carandrews	2.21	0.09	3.06	86.9	178.8	3.4	2.37	1.45	10.46	14.54±0.24	4	77	17.83±0.02	4.51±0.02	0.75	3
11261	(11261) 1978 XK	2.86	0.12	2.49	139.3	230.5	5.3	3.13	2.14	0.55	13.30±0.12	2	23	17.46±0.01	3.34±0.09	0.24	2
11333	(11333) Forman	2.43	0.20	4.97	174.9	192.9	3.6	2.76	1.78	2.84	14.38±0.08	4	78	18.19±0.02	3.00±0.02	0.12	2
11478	(11478) 1985 CD	2.58	0.13	14.72	151.6	54.9	6.9	2.36	1.37	0.70	12.96±0.11	4	79	15.49±0.00	5.27±0.06	0.10	2
11479	(11479) 1986 EP5	3.18	0.17	2.15	163.7	121.5	16.9	3.48	2.49	0.39	12.51±0.18	4	87	17.31±0.01	6.91±0.05	0.50	3
11556	(11556) 1993 DV	2.61	0.19	2.53	262.6	199.3	3.9	2.23	1.25	3.95	13.82±0.10	4	79	16.43±0.01	3.18±0.02	0.17	2
11572	(11572) Schindler	2.43	0.17	0.64	218.2	53.0	2.1	2.79	1.82	3.46	15.35±0.18	2	54	19.17±0.06	7.44±0.11	0.51	3
11681	(11681) Ortner	2.19	0.10	2.02	324.8	215.5	4.5	2.06	1.13	12.77	13.75±0.20	3	68	16.29±0.01	5.00±0.03	0.62	3
11716	(11716) Amahartman	2.64	0.19	2.99	344.5	339.1	4.9	3.10	2.19	8.07	14.55±0.13	4	75	19.21±0.06	2.53±0.01	0.27	2
12033	(12033) Anselmo	3.24	0.11	2.55	112.6	84.4	10.0	3.10	2.17	7.07	13.65±0.11	4	74	18.04±0.03	5.30±0.03	0.24	3

Table 2—Continued

Obj ID	Designation	a	e	i	Ω	ω	D	Δ	r	α	H_R	n	m	PTF_R	Period (hr)	Δm	U
12220 ^b	(12220) Semenchur	2.25	0.15	3.19	309.2	84.4	3.0 ^W	2.37	1.38	1.31	14.56±0.21	4	94	17.23±0.01	5.96±0.04	0.64	3
12263	(12263) 1989 YA4	2.28	0.14	0.33	259.3	254.1	3.5 ^W	2.01	1.05	8.79	14.62±0.15	4	78	16.64±0.01	2.75±0.02	0.06	2
12264	(12264) 1990 CD	2.28	0.11	5.57	287.2	319.7	4.0 ^W	2.44	1.46	4.62	13.82±0.11	4	79	16.94±0.01	4.16±0.02	0.14	3
12286	(12286) Poiseuille	2.24	0.06	2.08	59.0	197.1	2.6 ^W	2.33	1.42	11.99	14.59±0.12	4	75	18.00±0.02	2.59±0.02	0.17	3
12613	(12613) Hogarth	2.65	0.14	2.98	286.0	52.8	7.8 ^W	3.01	2.02	2.42	14.34±0.10	4	73	18.57±0.04	3.62±0.03	0.20	2
12755	(12755) Balmer	2.73	0.02	4.03	273.9	56.2	9.4 ^W	2.79	1.82	4.05	13.67±0.17	4	77	17.54±0.02	6.62±0.05	0.51	3
13085	(13085) Borlaug	2.76	0.08	0.19	274.0	347.7	7.7 ^W	2.92	1.98	6.60	14.06±0.11	4	73	18.30±0.03	5.52±0.06	0.15	2
13337	(13337) 1998 SZ114	2.73	0.06	1.43	88.5	252.3	5.1 ^W	2.90	1.92	1.71	13.72±0.10	3	51	17.67±0.02	4.00±0.03	0.23	3
13343	(13343) 1998 SY127	2.77	0.06	5.76	155.4	270.0	7.9 ^W	2.74	1.76	1.78	14.04±0.17	4	96	17.60±0.02	3.47±0.01	0.45	3
13349	(13349) 1998 SD139	2.75	0.04	4.69	329.2	331.2	7.3 ^W	2.83	1.85	0.48	14.18±0.13	4	84	17.79±0.02	3.22±0.01	0.39	3
13526 ^b	(13526) 1991 PQ5	2.27	0.13	6.63	142.4	164.0	2.4	2.53	1.54	1.72	15.08±0.22	4	104	18.22±0.03	6.23±0.04	0.71	3
13527	(13527) 1991 PJ15	2.30	0.14	3.05	118.8	167.7	2.8	2.62	1.66	6.69	14.76±0.04	1	28	18.42±0.03	7.33±1.05	0.12	2
13906*	(13906) Shunda	2.30	0.19	5.61	350.1	0.7	2.8 ^W	2.72	1.74	2.57	14.28±0.12	4	87	17.97±0.02	2.75±0.02	0.09	2
13952	(13952) 1990 SN6	2.38	0.08	4.86	122.2	183.5	6.3 ^W	2.57	1.62	7.22	13.72±0.35	4	81	17.25±0.01	7.38±0.06	1.17	3
14008	(14008) 1993 TD17	2.78	0.04	1.78	87.7	203.4	5.6 ^W	2.86	1.87	1.08	14.65±0.10	4	98	18.43±0.04	5.11±0.03	0.28	3
14090	(14090) 1997 MS3	2.76	0.11	5.44	137.0	199.1	3.1 ^W	3.06	2.07	1.63	14.75±0.15	4	95	18.80±0.05	3.08±0.01	0.27	3
14137 ^b	(14137) 1998 RB71	2.80	0.22	8.92	152.7	307.8	8.0 ^W	2.34	1.35	1.18	14.54±0.23	4	117	17.21±0.01	9.23±0.09	0.69	3
14383	(14383) 1990 OY3	2.37	0.13	5.98	324.8	7.2	3.2 ^W	2.63	1.69	8.01	13.91±0.09	2	54	17.68±0.02	8.73±0.08	0.29	3
14385	(14385) 1990 QG1	2.36	0.14	6.60	344.2	351.9	3.1 ^W	2.68	1.69	0.96	14.07±0.13	4	73	17.46±0.02	3.78±0.01	0.32	3
14744	(14744) 2092 P-L	2.65	0.12	5.14	323.5	11.6	5.9 ^W	2.97	1.99	1.64	14.20±0.13	3	82	18.09±0.03	2.49±0.01	0.22	3
14755	(14755) 6069 P-L	2.78	0.16	1.64	331.1	291.6	4.9 ^W	2.85	1.86	1.10	14.01±0.16	4	84	17.83±0.02	3.27±0.01	0.42	3
14768	(14768) 1238 T-1	2.87	0.07	1.58	339.6	345.9	4.1 ^W	3.05	2.12	7.43	14.55±0.19	4	78	19.10±0.06	9.32±0.09	0.52	3
14795	(14795) Syoyou	3.05	0.23	2.75	346.6	301.1	10.1 ^W	3.41	2.42	1.24	13.26±0.10	4	86	18.11±0.03	3.43±0.01	0.15	2
14985	(14985) 1997 UU2	2.90	0.03	1.59	313.3	94.4	5.5 ^W	2.91	1.92	1.03	13.34±0.11	4	78	17.25±0.01	13.91±0.20	0.13	2
14990	(14990) Zermelo	2.98	0.08	1.53	189.2	254.4	4.8 ^W	2.77	1.79	2.96	13.91±0.18	4	82	17.58±0.02	4.82±0.02	0.46	3
14992	(14992) 1997 UY14	2.95	0.12	2.94	62.6	322.0	5.6 ^W	2.94	2.00	6.44	13.83±0.19	4	73	18.11±0.03	12.97±0.18	0.50	2
15151*	(15151) Wilmacherup	2.36	0.23	2.23	18.2	302.1	3.6 ^W	2.89	1.90	0.99	14.28±0.18	3	65	18.12±0.03	4.55±0.02	0.52	3
15195	(15195) 2407 T-3	2.90	0.08	1.34	355.9	2.4	6.3	3.10	2.11	1.26	14.76±0.11	4	81	18.89±0.05	13.33±0.19	0.41	3
15338	(15338) Dufault	2.93	0.12	2.94	96.4	101.4	3.9 ^W	2.82	1.87	5.58	14.68±0.35	4	74	18.74±0.04	9.41±0.09	1.08	3
15339	(15339) Pierazzo	2.93	0.08	3.10	127.7	247.6	5.0 ^W	2.94	1.96	2.68	13.51±0.15	4	80	17.56±0.02	5.61±0.03	0.25	3
15360	(15360) Moncalvo	2.37	0.18	2.92	104.3	101.9	1.9	2.31	1.34	4.88	15.57±0.10	3	68	18.43±0.03	5.71±0.10	0.13	2
15402	(15402) Suzaku	2.42	0.19	2.27	94.3	211.3	2.7	2.88	1.97	9.19	14.85±0.14	4	63	19.22±0.06	3.13±0.02	0.45	3

Table 2—Continued

Obj ID	Designation	a	e	i	Ω	ω	D	Δ	r	α	H_R	n	m	PTF_R	Period (hr)	Δm	U
15409	(15409) 1997 WQ31	2.95	0.12	3.14	79.8	294.4	4.6 ^W	3.05	2.15	9.13	13.63±0.11	3	66	18.29±0.03	2.73±0.02	0.16	2
15414	(15414) Pettrossi	2.95	0.04	3.19	108.7	54.6	4.2 ^W	2.86	1.93	7.99	13.79±0.11	4	76	18.06±0.02	2.71±0.02	0.21	3
15468	(15468) Mondriaan	2.91	0.01	1.81	356.3	309.5	5.3 ^W	2.95	1.96	0.57	13.55±0.09	4	103	17.51±0.02	2.64±0.02	0.10	2
15481	(15481) 1999 CK19	2.38	0.14	4.12	331.1	344.6	4.7 ^W	2.69	1.70	0.78	14.04±0.11	4	81	17.44±0.02	5.05±0.08	0.14	2
15492	(15492) Nyberg	2.43	0.18	2.13	341.4	46.0	7.3 ^W	2.34	1.37	6.60	14.50±0.17	4	63	17.50±0.02	8.28±0.07	0.27	3
15564	(15564) 2000 GU48	2.94	0.05	1.33	327.6	330.6	5.3 ^W	3.09	2.12	3.89	13.71±0.16	4	82	18.13±0.03	6.08±0.04	0.38	3
15596	(15596) 2000 GZ95	2.40	0.19	1.85	326.5	315.0	5.0 ^W	2.82	1.87	6.15	13.68±0.19	4	64	17.90±0.02	2.93±0.01	0.25	3
15755	(15755) 1992 ET5	3.18	0.16	6.83	124.5	237.2	8.4 ^W	3.31	2.35	3.68	13.79±0.17	4	67	18.51±0.04	6.23±0.04	0.36	3
15770 ^b	(15770) 1993 FL29	3.08	0.18	3.81	290.4	80.6	8.7 ^W	3.44	2.46	2.08	13.39±0.16	4	73	18.28±0.03	9.90±0.10	0.40	2
15941	(15941) Stevegauthier	3.05	0.11	14.43	294.4	354.3	14.9 ^W	3.38	2.42	4.43	12.83±0.14	4	83	17.78±0.02	9.90±0.10	0.28	3
15973	(15973) 1998 FM85	3.07	0.06	11.80	146.0	345.7	13.2	2.91	1.92	1.00	13.15±0.14	4	79	17.10±0.01	5.82±0.04	0.40	3
16034	(16034) 1999 FW32	2.47	0.10	4.76	318.0	331.4	4.2 ^W	2.72	1.78	7.51	13.76±0.18	4	77	17.72±0.02	3.69±0.01	0.34	2
16048	(16048) 1999 JU23	3.06	0.10	0.85	39.1	192.8	9.7 ^W	3.13	2.20	7.02	13.60±0.16	3	67	18.29±0.03	6.11±0.08	0.33	3
16143 ^b	(16143) 1999 XK142	2.26	0.34	9.32	311.6	21.8	3.9	2.82	1.90	8.19	14.05±0.33	4	77	18.25±0.03	6.40±0.04	1.00	3
16204	(16204) 2000 CT33	2.84	0.02	1.28	2.3	248.5	4.6 ^W	2.88	1.92	4.29	14.20±0.17	4	75	18.27±0.03	4.21±0.02	0.49	3
16306	(16306) 6797 P-L	2.39	0.15	2.00	50.0	192.2	2.6	2.53	1.61	9.95	14.95±0.16	2	54	18.56±0.03	5.22±0.03	0.52	3
16326	(16326) 2052 T-2	2.84	0.05	1.20	307.9	2.9	5.6 ^W	2.97	1.98	0.50	13.50±0.13	4	85	17.52±0.02	3.07±0.01	0.28	3
16565	(16565) 1992 CZ1	3.14	0.13	3.55	321.9	196.1	15.8 ^W	2.79	1.87	9.04	12.54±0.19	4	77	16.66±0.01	5.85±0.04	0.50	3
16642	(16642) 1993 RK4	2.44	0.12	1.80	306.2	234.3	2.7 ^W	2.30	1.32	3.75	14.79±0.32	2	22	17.72±0.02	7.68±0.12	0.60	2
16682	(16682) Donati	2.24	0.05	2.28	193.4	260.0	2.2 ^W	2.17	1.19	4.41	14.98±0.15	3	59	17.43±0.01	4.64±0.02	0.42	3
16696	(16696) 1995 BE7	2.45	0.14	3.35	113.5	94.8	4.3 ^W	2.42	1.45	5.73	14.67±0.19	4	57	17.84±0.02	4.51±0.02	0.46	3
16743	(16743) 1996 OQ	2.44	0.18	1.69	297.4	0.6	3.1	2.79	1.81	2.72	14.58±0.12	4	81	18.26±0.03	2.75±0.01	0.19	3
16786	(16786) 1997 AT1	3.18	0.11	12.64	296.7	171.8	24.6 ^W	2.83	1.86	3.59	12.04±0.18	1	28	15.93±0.01	4.02±0.08	0.52	3
16825	(16825) 1997 VC8	2.47	0.03	2.73	298.2	44.0	3.0 ^W	2.52	1.56	5.61	14.24±0.04	3	57	17.61±0.02	2.46±0.02	0.08	2
16892	(16892) Vaissiere	3.12	0.14	2.29	85.0	200.4	11.0 ^W	3.56	2.60	4.16	12.98±0.11	4	79	18.17±0.02	3.33±0.01	0.18	3
16923	(16923) 1998 FB61	3.20	0.17	0.58	332.0	16.2	11.2 ^W	3.53	2.61	6.33	13.35±0.20	4	72	18.59±0.04	5.93±0.04	0.59	3
17150	(17150) 1999 JP109	3.18	0.17	2.60	120.5	230.9	10.8 ^W	3.38	2.40	2.13	13.30±0.09	4	78	18.07±0.02	6.23±0.08	0.14	3
17543	(17543) Sosva	3.24	0.10	18.02	306.7	258.9	10.5 ^W	3.18	2.24	5.91	12.61±0.15	4	77	17.31±0.01	7.56±0.06	0.37	3
17573	(17573) 1994 PJ13	3.20	0.16	1.29	159.2	227.7	10.1 ^W	3.41	2.43	1.60	13.41±0.11	4	82	18.18±0.03	4.95±0.03	0.19	3
17592	(17592) 1995 DR	2.44	0.14	6.96	155.8	86.2	6.2 ^W	2.37	1.38	1.08	14.96±0.13	1	15	17.74±0.01	3.25±0.24	0.10	2
17593	(17593) 1995 DV	2.44	0.15	4.89	4.9	246.3	2.8	2.43	1.44	1.96	14.80±0.13	2	32	17.74±0.02	3.62±0.01	0.21	2
17599	(17599) 1995 ON4	2.57	0.11	2.78	135.7	106.6	3.3 ^W	2.71	1.75	6.03	14.55±0.11	4	82	18.38±0.03	3.24±0.02	0.18	2

Table 2—Continued

Obj ID	Designation	a	e	i	Ω	ω	D	Δ	r	α	H_R	n	m	PTF_R	Period (hr)	Δm	U
18035	(18035) 1999 NJ7	2.58	0.07	5.44	129.6	286.0	3.8 ^W	2.59	1.60	1.53	13.72±0.10	3	81	17.15±0.01	4.30±0.04	0.16	2
18047	(18047) 1999 RP145	3.20	0.13	13.70	321.5	346.3	11.7 ^W	3.59	2.61	1.37	12.43±0.12	4	81	17.48±0.02	11.57±0.14	0.26	2
18109*	(18109) 2000 NG11	1.88	0.37	0.81	59.5	319.2	1.2	1.69	0.73	10.77	16.64±0.29	4	87	18.02±0.03	4.25±0.02	0.88	3
18194	(18194) 2000 QE100	3.16	0.01	10.17	150.3	320.7	9.6	3.12	2.15	3.42	13.85±0.18	3	61	18.32±0.03	17.14±0.31	0.56	3
18323	(18323) 1983 RZ2	2.57	0.20	8.91	112.8	215.5	5.7 ^W	2.95	1.97	2.78	13.46±0.20	4	78	17.51±0.02	3.29±0.01	0.64	3
18382	(18382) 1992 EG22	2.17	0.18	5.16	96.7	225.7	3.2	2.51	1.56	7.70	14.51±0.15	4	75	18.00±0.03	5.89±0.04	0.31	3
18421	(18421) 1993 TV34	2.20	0.07	0.97	86.1	358.2	2.8	2.06	1.08	3.03	14.80±0.14	4	80	16.84±0.01	3.61±0.01	0.30	3
18444	(18444) 1994 PL10	3.13	0.19	2.82	322.8	8.6	8.9 ^W	3.73	2.74	0.43	14.04±0.12	4	74	19.25±0.07	4.19±0.02	0.34	2
18449	(18449) Rikwouters	3.11	0.18	1.85	182.1	124.4	10.6	3.58	2.59	0.50	13.64±0.11	4	81	18.58±0.04	3.65±0.03	0.17	2
18645	(18645) 1998 EM19	3.12	0.14	0.34	257.1	358.5	10.5 ^W	3.41	2.46	5.26	13.66±0.17	4	72	18.72±0.04	3.68±0.01	0.33	3
18669	(18669) Lalitpatel	3.09	0.14	2.95	123.2	137.4	6.8 ^W	3.14	2.16	2.43	14.12±0.17	2	33	18.56±0.04	7.74±0.13	0.54	3
18672	(18672) Ashleyamini	2.58	0.08	1.49	280.6	200.4	4.0 ^W	2.38	1.42	7.24	14.23±0.16	4	77	17.33±0.02	10.11±0.11	0.41	2
18861	(18861) Eugenishmidt	2.58	0.12	6.65	110.6	120.6	3.7 ^W	2.63	1.72	10.02	14.17±0.10	4	72	18.10±0.03	3.93±0.02	0.14	2
18941	(18941) 2000 QX50	3.14	0.12	6.03	140.2	335.1	11.3	2.82	1.84	1.93	13.50±0.13	1	24	17.26±0.01	9.14±0.42	0.35	3
19022	(19022) Penzel	2.54	0.08	2.18	11.2	60.7	5.2 ^W	2.49	1.51	1.71	15.24±0.14	4	86	18.14±0.03	16.27±0.57	0.30	3
19289*	(19289) 1996 HY12	2.12	0.13	1.63	197.1	101.5	2.2	2.35	1.38	5.99	15.32±0.07	4	73	18.31±0.03	2.85±0.02	0.12	2
19434	(19434) Bahuffman	2.58	0.12	0.74	24.6	147.9	2.1 ^W	2.39	1.43	7.10	15.07±0.15	4	77	18.26±0.03	4.78±0.02	0.17	3
19540	(19540) 1999 JF23	2.15	0.17	1.24	102.5	190.5	1.9	2.50	1.54	5.04	15.65±0.14	4	76	18.96±0.06	3.28±0.03	0.34	2
19634	(19634) 1999 RG45	3.17	0.18	6.53	327.4	334.6	17.8 ^W	3.64	2.66	0.53	12.81±0.10	4	83	17.68±0.02	4.32±0.02	0.19	2
19917	(19917) 1977 EE8	3.39	0.05	1.86	308.3	237.3	12.1	3.26	2.28	2.63	13.35±0.20	4	70	17.95±0.02	5.25±0.03	0.56	3
20009	(20009) 1991 OY	2.56	0.21	8.63	150.2	180.8	5.5	3.09	2.10	1.54	14.32±0.11	4	102	18.57±0.04	2.97±0.01	0.24	3
20186	(20186) 1997 AD8	2.64	0.11	2.10	258.3	103.6	3.5 ^W	2.73	1.76	4.67	15.24±0.13	4	71	18.99±0.06	4.17±0.02	0.32	3
20261	(20261) 1998 FM12	2.57	0.21	3.99	158.9	139.6	6.2 ^W	3.03	2.05	4.11	14.18±0.10	2	42	18.53±0.03	4.55±0.04	0.17	2
20327	(20327) 1998 HQ39	3.21	0.17	2.09	42.4	255.4	8.0 ^W	3.74	2.81	5.43	13.94±0.17	4	68	19.46±0.07	4.38±0.04	0.37	2
20507	(20507) 1999 RU19	2.19	0.12	0.08	98.7	132.5	2.7	2.27	1.31	7.72	14.83±0.16	4	81	17.72±0.02	10.32±0.11	0.28	3
20561	(20561) 1999 RE120	2.18	0.03	0.95	270.1	247.3	2.8	2.12	1.13	3.44	14.76±0.20	4	83	17.00±0.01	4.47±0.02	0.45	3
20623	(20623) Davidyoung	2.64	0.19	12.62	326.3	23.6	6.2 ^W	3.09	2.11	2.75	12.91±0.11	4	89	17.44±0.01	20.43±0.44	0.34	3
20639	(20639) Michellouie	2.65	0.10	9.73	299.4	168.2	4.0 ^W	2.38	1.41	5.21	13.76±0.14	4	78	16.86±0.01	3.50±0.01	0.27	3
20861	(20861) Lesliebeh	2.62	0.10	2.64	120.3	285.9	4.1	2.49	1.51	2.87	14.93±0.14	4	82	18.10±0.03	3.45±0.02	0.17	3
20942	(20942) 2092 T-2	2.65	0.10	5.29	181.3	337.1	2.5 ^W	2.39	1.42	4.66	14.58±0.08	4	77	17.63±0.02	2.35±0.01	0.12	2
21023*	(21023) 1989 DK	2.61	0.10	11.92	298.4	174.9	8.0 ^W	2.33	1.37	5.43	12.83±0.15	4	51	15.70±0.00	7.62±0.12	0.17	3
21146	(21146) 1993 FD67	2.70	0.21	1.75	276.9	72.9	5.7	2.88	1.90	2.04	14.22±0.12	3	65	18.19±0.03	2.53±0.01	0.32	3

Table 2—Continued

Obj ID	Designation	a	e	i	Ω	ω	D	Δ	r	α	H_R	n	m	PTF_R	Period (hr)	Δm	U
21168	(21168) 1994 AC8	2.24	0.13	4.40	96.8	129.1	2.5	2.30	1.34	6.29	15.25±0.12	3	67	18.17±0.02	6.00±0.11	0.24	3
21212	(21212) 1994 PG39	3.14	0.14	0.63	220.0	35.7	5.7	3.43	2.48	5.22	14.42±0.16	4	73	19.47±0.07	4.36±0.08	0.37	2
21229	(21229) Susil	2.64	0.08	1.14	84.8	270.0	3.9	2.75	1.80	7.10	15.98±0.18	1	24	19.94±0.09	6.11±0.47	0.58	2
21275	(21275) Tosiyasu	2.18	0.18	1.15	39.3	293.7	1.8	2.58	1.59	1.40	15.69±0.17	4	83	19.07±0.05	6.96±0.05	0.33	2
21745	(21745) Shadfan	2.61	0.07	4.42	334.9	131.4	3.5	2.49	1.50	1.34	14.72±0.13	4	83	17.89±0.02	2.77±0.02	0.12	2
22225	(22225) 4091 T-2	2.65	0.20	3.44	109.3	205.5	6.5	3.15	2.20	6.06	14.69±0.11	2	49	19.35±0.06	4.09±0.04	0.38	2
22229 ^b	(22229) 5415 T-2	2.21	0.13	5.81	294.5	133.5	2.1	2.00	1.03	6.94	15.44±0.19	4	81	17.49±0.02	14.55±0.22	0.57	3
22231	(22231) 2239 T-3	2.68	0.11	5.00	322.6	190.1	3.1	2.40	1.50	11.88	14.65±0.12	4	70	18.04±0.02	3.19±0.01	0.17	3
22442	(22442) Blaha	2.19	0.03	0.88	0.3	355.7	2.0	2.25	1.26	1.22	15.69±0.24	4	80	18.04±0.03	4.38±0.02	0.71	3
22501	(22501) 1997 PR3	2.37	0.17	1.57	110.1	142.4	1.8	2.60	1.67	9.11	15.71±0.11	2	33	19.49±0.08	4.21±0.11	0.45	2
22657	(22657) 1998 QN8	2.67	0.11	3.46	315.0	10.3	6.0	2.95	1.97	0.70	13.73±0.13	4	86	17.73±0.02	3.18±0.02	0.18	2
22742	(22742) 1998 TX5	2.79	0.12	1.90	268.7	27.1	5.7	3.14	2.17	3.54	13.27±0.10	4	73	17.70±0.02	6.62±0.09	0.21	2
23021	(23021) 1999 WR3	2.75	0.12	3.19	112.2	259.5	5.2	2.78	1.80	3.50	13.79±0.12	4	80	17.66±0.02	3.50±0.03	0.16	2
23049	(23049) 1999 XT30	2.74	0.17	10.27	116.2	237.7	5.3	2.94	1.99	5.87	14.40±0.20	4	80	18.56±0.04	4.30±0.02	0.52	3
23163	(23163) 2000 FG49	2.37	0.23	1.49	253.6	59.0	2.7	2.91	1.95	4.78	14.90±0.19	3	57	19.02±0.06	5.82±0.04	0.57	2
23190	(23190) Klages-Mundt	2.52	0.14	4.11	141.9	270.7	2.8	2.53	1.54	0.88	14.69±0.11	4	83	17.84±0.02	7.22±0.05	0.25	3
23339	(23339) 3025 P-L	2.64	0.15	11.57	308.9	334.2	7.1	2.89	1.92	4.22	14.44±0.11	4	77	18.49±0.04	4.85±0.05	0.18	2
23374	(23374) 2207 T-2	3.14	0.16	0.27	114.9	212.1	7.1	3.51	2.53	1.77	14.22±0.20	2	27	19.14±0.06	5.42±0.13	0.68	2
23507	(23507) 1992 EQ13	2.73	0.08	4.16	280.1	98.9	7.7	2.73	1.75	3.48	14.16±0.13	4	78	18.05±0.03	3.11±0.02	0.18	2
23718	(23718) Horgos	2.57	0.19	1.44	324.7	318.6	2.9	2.83	1.84	0.60	14.69±0.11	3	64	18.42±0.03	3.57±0.03	0.21	2
23874	(23874) 1998 RB77	2.76	0.09	4.71	129.9	283.9	6.0	2.79	1.80	1.86	13.23±0.10	3	68	16.95±0.01	8.14±0.20	0.05	2
23875	(23875) Strube	2.68	0.19	3.71	105.8	192.4	7.1	3.04	2.05	1.86	14.30±0.13	4	84	18.50±0.04	4.23±0.02	0.35	3
23900	(23900) Urakawa	2.79	0.03	3.27	274.6	13.2	10.9	2.88	1.90	2.33	13.64±0.14	1	25	17.56±0.02	7.93±0.55	0.43	2
24054	(24054) 1999 TZ37	2.23	0.12	3.09	149.3	278.7	2.1	2.15	1.17	3.69	15.43±0.17	3	67	17.77±0.02	12.15±0.15	0.61	2
24290	(24290) 1999 XS190	2.75	0.03	7.68	302.1	77.7	8.5	2.76	1.79	4.70	14.06±0.18	4	77	17.92±0.02	5.36±0.03	0.50	3
24344 ^b	(24344) Brianbarnett	2.26	0.14	3.32	108.5	278.2	2.0	2.20	1.24	6.59	15.55±0.20	4	80	18.21±0.03	6.62±0.05	0.45	3
24516	(24516) 2001 BB66	2.69	0.14	6.64	136.8	238.5	5.3	2.96	1.98	1.66	13.76±0.09	3	50	17.85±0.02	3.86±0.03	0.11	3
24706	(24706) 1991 PA5	2.28	0.16	3.16	307.7	0.7	2.4	2.63	1.66	4.72	15.11±0.10	3	48	18.69±0.04	4.47±0.06	0.21	2
24783	(24783) 1993 SQ13	2.80	0.01	0.92	60.5	126.7	6.9	2.79	1.85	7.43	14.83±0.13	4	70	18.94±0.05	4.19±0.04	0.28	3
24898	(24898) Alanholmes	2.26	0.12	1.93	261.9	320.9	2.4	2.32	1.35	4.16	15.11±0.20	4	78	17.95±0.02	6.86±0.05	0.62	3
25050	(25050) Michmadsen	2.29	0.14	5.29	118.5	141.1	3.4	2.55	1.57	3.85	14.59±0.08	2	37	17.89±0.02	9.70±0.10	0.27	3
25079 ^b	(25079) 1998 QU103	2.79	0.10	4.98	107.0	305.4	5.6	2.67	1.74	8.85	13.76±0.19	4	78	17.68±0.02	3.19±0.01	0.60	3

Table 2—Continued

Obj ID	Designation	a	e	i	Ω	ω	D	Δ	r	α	H_R	n	m	PTF_R	Period (hr)	Δm	U
25081	(25081) 1998 QR108	2.74	0.16	13.33	150.3	256.7	3.6	2.78	1.79	1.38	14.52±0.22	4	85	18.02±0.03	30.97±0.97	0.60	3
25220	(25220) 1998 TQ6	2.35	0.14	7.75	113.1	243.1	2.7	2.53	1.63	11.02	13.98±0.13	4	71	17.67±0.02	8.65±0.16	0.13	3
25313	(25313) 1998 YV8	2.81	0.17	3.08	214.8	155.1	5.9	3.11	2.13	3.47	14.78±0.08	4	73	19.17±0.05	3.32±0.02	0.19	2
25773	(25773) 2000 CX27	2.78	0.05	3.39	306.1	358.8	10.6	2.91	1.92	1.38	13.88±0.16	4	78	17.82±0.02	11.85±0.14	0.49	2
26090	(26090) 1986 PU1	2.40	0.20	1.97	27.8	324.7	2.4	2.63	1.69	7.93	15.11±0.14	3	67	18.88±0.05	4.23±0.07	0.33	2
26399 ^b	(26399) Rileyennis	2.26	0.12	4.36	108.0	113.2	2.2	2.30	1.33	6.36	15.34±0.21	4	81	18.30±0.03	20.00±0.41	0.56	3
26836	(26836) 1991 PA6	2.95	0.13	1.09	350.6	333.9	3.9	3.29	2.37	6.90	14.35±0.16	4	94	19.27±0.06	3.61±0.01	0.47	3
26881 ^b	(26881) 1994 PF11	2.34	0.06	2.33	313.7	260.3	2.3	2.36	1.39	3.96	15.67±0.19	3	60	18.58±0.04	6.76±0.05	0.64	3
27039	(27039) 1998 RU61	2.31	0.08	3.46	338.3	183.6	2.8	2.12	1.13	1.09	14.74±0.08	4	88	16.81±0.01	4.38±0.02	0.18	3
27094	(27094) Salgari	2.37	0.14	5.52	283.6	89.0	3.2	2.38	1.40	3.77	14.58±0.14	2	38	17.53±0.02	6.67±0.05	0.40	2
27134	(27134) 1998 XO11	2.85	0.05	1.62	348.3	304.2	5.2	2.95	1.96	0.58	13.60±0.13	4	83	17.55±0.02	3.19±0.01	0.34	3
27205	(27205) 1999 CY75	2.97	0.17	7.27	307.0	74.0	6.1	2.99	2.06	7.58	13.14±0.09	4	93	17.59±0.02	7.68±0.06	0.20	3
27208 ^b	(27208) Jennyliu	2.92	0.14	1.17	279.9	182.3	8.3	2.62	1.63	0.77	14.17±0.21	4	88	17.48±0.01	9.14±0.09	0.59	3
27295	(27295) 2000 AU143	2.79	0.08	17.95	147.4	331.7	6.5	2.60	1.62	1.90	13.93±0.14	3	55	17.15±0.01	9.90±0.10	0.27	3
27460	(27460) 2000 GW42	2.92	0.03	2.27	0.3	9.1	3.5	2.95	2.01	7.15	13.69±0.10	4	75	18.14±0.02	7.01±0.20	0.10	2
27502	(27502) Stephbecca	2.87	0.02	2.96	45.5	24.3	6.9	2.87	1.88	1.95	14.55±0.15	4	87	18.51±0.04	6.96±0.05	0.34	3
27618	(27618) Ceilierin	2.27	0.15	6.52	119.6	149.7	2.7	2.55	1.62	8.24	15.60±0.15	4	71	19.25±0.06	7.33±0.11	0.37	2
27722	(27722) 1990 OB2	3.02	0.35	11.76	349.2	0.2	7.1	4.00	3.01	1.34	13.63±0.17	4	80	19.14±0.06	11.29±0.13	0.42	2
27778	(27778) 1992 DF6	2.39	0.15	3.50	111.8	350.8	4.5	2.04	1.10	11.02	14.18±0.19	4	68	16.62±0.01	4.27±0.02	0.56	3
27834	(27834) 1994 PW13	2.34	0.06	6.65	329.3	146.0	3.0	2.22	1.23	1.18	14.74±0.18	4	97	17.06±0.01	4.25±0.02	0.47	3
27848	(27848) 1994 UZ	2.38	0.21	1.94	342.8	52.4	2.5	2.54	1.55	1.27	14.97±0.12	4	84	18.24±0.03	7.74±0.06	0.15	2
28063	(28063) 1998 OR14	2.70	0.05	5.42	335.9	116.2	3.7	2.64	1.65	1.17	14.16±0.15	4	80	17.59±0.02	7.01±0.05	0.21	3
28071	(28071) 1998 QC26	2.71	0.15	3.53	340.7	346.4	4.7	3.10	2.11	0.67	14.63±0.14	4	83	18.72±0.04	10.11±0.11	0.32	3
28371	(28371) 1999 GG39	2.99	0.08	10.12	161.9	188.4	9.9	3.20	2.22	1.86	13.05±0.28	4	87	17.53±0.02	4.07±0.02	0.77	3
28528	(28528) 2000 DC70	2.33	0.22	7.40	154.1	146.0	2.8	2.76	1.78	3.76	14.77±0.09	4	73	18.58±0.04	6.00±0.07	0.18	2
28707	(28707) Drewbecker	2.88	0.04	1.19	224.5	67.9	3.0	2.98	1.99	2.67	15.70±0.14	3	53	19.85±0.10	4.47±0.12	0.30	2
29033 ^b	(29033) 2085 T-1	3.09	0.17	1.92	125.7	322.6	8.6	2.59	1.61	3.02	13.83±0.22	4	77	17.31±0.01	15.00±0.23	0.81	3
29252	(29252) Konjikido	3.03	0.12	5.48	306.1	201.9	9.4	2.69	1.75	7.36	13.88±0.23	3	59	17.70±0.02	6.81±0.05	0.83	3
29297	(29297) 1993 RU7	2.44	0.08	1.60	300.3	168.5	3.3	2.29	1.31	4.45	14.63±0.11	4	78	17.35±0.02	3.09±0.02	0.21	2
29335	(29335) 1994 XL	2.41	0.19	3.76	355.9	160.5	3.0	1.95	0.97	2.50	14.43±0.11	4	89	16.07±0.01	6.96±0.05	0.13	3
29534	(29534) 1998 BP7	3.03	0.10	1.67	160.3	273.2	7.5	2.93	1.94	0.90	14.25±0.14	4	81	18.14±0.03	5.65±0.03	0.23	3
29548	(29548) 1998 BC42	3.10	0.02	11.79	118.1	341.7	8.2	3.03	2.06	3.57	13.99±0.11	4	79	18.28±0.04	4.29±0.02	0.24	3

Table 2—Continued

Obj ID	Designation	a	e	i	Ω	ω	D	Δ	r	α	H_R	n	m	PTF_R	Period (hr)	Δm	U
29584	(29584) 1998 FQ60	3.11	0.17	0.84	357.5	85.7	9.6	2.85	1.86	0.48	13.58±0.11	4	94	17.35±0.01	4.66±0.02	0.20	3
29804	(29804) 1999 CH90	2.40	0.18	2.05	330.4	26.0	6.5	2.77	1.78	2.16	14.84±0.09	2	43	18.54±0.03	3.19±0.03	0.16	2
29955	(29955) 1999 JE90	3.08	0.04	10.90	116.3	73.2	5.4	3.05	2.07	3.03	13.78±0.15	4	71	18.08±0.02	3.98±0.03	0.24	3
30168	(30168) 2000 GG66	2.41	0.18	1.61	235.1	54.7	2.4	2.84	1.87	2.74	15.09±0.10	2	47	18.93±0.05	5.68±0.16	0.21	2
30467	(30467) 2000 OV14	3.06	0.05	8.04	306.9	52.2	8.1	3.18	2.21	3.88	13.30±0.21	4	99	17.86±0.02	5.93±0.04	0.60	3
30491	(30491) 2000 QJ38	3.19	0.17	2.17	133.0	316.7	8.7	2.70	1.75	6.60	13.86±0.11	4	69	17.71±0.02	3.60±0.04	0.12	2
30567	(30567) 2001 OR90	2.36	0.13	3.00	218.8	163.1	1.5	2.51	1.53	4.68	16.13±0.12	4	66	19.42±0.07	3.62±0.03	0.33	2
30772	(30772) 1986 RJ1	2.38	0.25	5.15	343.0	355.9	6.3	2.97	1.98	0.92	14.86±0.17	4	59	18.83±0.05	8.07±0.07	0.52	3
31234	(31234) 1998 CL1	3.06	0.18	2.21	254.3	225.6	5.5	2.57	1.59	3.50	15.05±0.11	4	73	18.44±0.03	3.56±0.03	0.18	2
31291	(31291) 1998 FH64	3.16	0.14	2.69	138.5	51.3	7.6	3.01	2.03	2.35	14.23±0.15	4	67	18.40±0.03	3.62±0.04	0.12	2
31427	(31427) 1999 BS5	2.43	0.14	0.66	260.7	290.6	2.0	2.32	1.35	3.75	15.49±0.23	4	82	18.23±0.03	5.36±0.03	0.61	3
31641	(31641) 1999 GW34	2.44	0.13	1.21	278.4	215.6	2.7	2.13	1.15	1.74	14.94±0.20	4	80	17.00±0.01	2.82±0.01	0.54	3
31716	(31716) 1999 JJ57	3.04	0.15	3.45	162.3	89.4	5.9	3.07	2.09	2.15	14.34±0.12	4	77	18.61±0.04	4.59±0.02	0.22	3
31774	(31774) 1999 JW121	3.04	0.12	2.60	144.9	97.0	5.4	3.00	2.01	0.75	14.55±0.09	4	87	18.57±0.04	3.17±0.02	0.27	2
31818	(31818) 1999 RM135	3.22	0.06	22.64	340.0	170.0	19.5	3.02	2.04	1.69	12.20±0.15	3	66	16.22±0.01	5.36±0.03	0.51	3
31862	(31862) 2000 EY70	2.38	0.14	8.65	106.8	245.9	2.3	2.52	1.56	5.70	15.09±0.22	4	71	18.50±0.03	5.71±0.03	0.62	3
31888	(31888) 2000 FM35	2.35	0.14	7.31	159.7	143.8	2.4	2.64	1.67	3.77	15.14±0.12	4	98	18.75±0.04	5.13±0.03	0.26	3
31978	(31978) 2000 HA14	2.37	0.18	2.02	15.0	222.4	2.3	2.47	1.56	11.19	15.22±0.12	3	61	18.80±0.04	3.42±0.02	0.27	2
32089	(32089) 2000 KO28	2.40	0.15	1.29	171.5	70.4	1.9	2.56	1.60	5.73	15.62±0.19	4	73	19.12±0.06	6.62±0.05	0.70	3
32145 ^b	(32145) 2000 LE30	2.42	0.18	9.02	105.9	139.4	4.4	2.64	1.68	5.11	14.67±0.25	2	57	18.30±0.03	9.14±0.09	0.85	3
32215	(32215) 2000 OG16	3.12	0.20	2.67	101.7	229.5	8.3	3.65	2.73	6.35	14.19±0.28	2	49	19.65±0.08	8.00±0.07	0.90	3
32254	(32254) 2000 OR51	3.22	0.07	13.32	290.2	54.9	15.5	3.34	2.36	2.42	12.92±0.14	4	81	17.66±0.02	5.42±0.03	0.33	3
32290	(32290) 2000 QH5	2.45	0.13	12.88	344.1	221.9	6.9	2.24	1.25	2.43	14.45±0.10	3	38	16.92±0.01	3.42±0.01	0.28	2
32354	(32354) 2000 QN119	3.15	0.07	9.49	313.3	260.5	9.0	3.13	2.22	8.00	13.67±0.15	4	69	18.56±0.04	3.93±0.03	0.18	2
33121	(33121) 1998 BR15	2.54	0.11	9.25	105.2	202.1	4.2	2.81	1.85	5.42	14.69±0.28	1	26	18.68±0.04	6.23±0.17	0.80	2
33165	(33165) 1998 EO2	3.19	0.25	2.19	143.0	200.7	10.8	3.94	2.96	1.16	13.59±0.14	4	81	19.05±0.05	17.78±0.34	0.41	3
33197	(33197) 1998 FA52	3.17	0.11	2.97	105.4	123.7	7.6	3.29	2.32	2.60	14.35±0.13	4	86	18.99±0.05	6.71±0.05	0.32	3
33329	(33329) 1998 RY77	2.30	0.11	5.27	152.1	51.7	3.5	2.13	1.15	3.49	14.62±0.10	4	83	16.65±0.01	3.45±0.01	0.21	3
34154	(34154) 2000 QC20	2.48	0.15	3.16	140.0	124.2	2.3	2.79	1.81	2.91	15.24±0.22	4	76	19.04±0.07	6.62±0.05	0.72	3
34217	(34217) 2000 QA78	2.48	0.18	6.11	344.1	357.9	3.3	2.91	1.93	0.85	14.17±0.10	4	74	18.04±0.03	7.33±0.06	0.25	3
34226	(34226) 2000 QM88	2.54	0.23	4.38	270.9	74.7	5.0	2.80	1.83	3.38	14.53±0.15	4	81	18.28±0.03	3.25±0.01	0.26	3
34319	(34319) 2000 QD193	3.10	0.16	3.41	106.4	168.0	6.5	3.54	2.57	3.13	14.64±0.21	4	60	19.75±0.09	8.57±0.15	0.57	2

Table 2—Continued

Obj ID	Designation	a	e	i	Ω	ω	D	Δ	r	α	H_R	n	m	PTF_R	Period (hr)	Δm	U
34389	(34389) 2000 RJ65	3.13	0.13	2.40	12.7	322.8	8.3	3.55	2.56	0.69	14.16±0.10	4	74	19.00±0.05	2.83±0.02	0.26	2
34715	(34715) 2001 PO12	2.99	0.14	16.43	119.6	54.7	6.4	2.68	1.77	9.51	12.99±0.21	4	78	16.97±0.01	13.71±0.19	0.50	3
34734	(34734) 2001 QS64	3.07	0.23	2.81	96.8	330.2	7.1	2.88	1.89	1.52	14.50±0.13	4	86	18.36±0.04	3.60±0.01	0.38	3
34739	(34739) 2001 QO75	3.14	0.19	0.56	292.0	158.3	8.4	2.79	1.80	0.53	14.13±0.09	3	63	17.83±0.02	11.29±0.13	0.21	3
34794	(34794) 2001 SS25	3.09	0.12	1.33	108.9	298.3	7.7	2.95	2.01	6.66	13.73±0.15	3	50	18.11±0.03	10.55±0.11	0.35	2
34824	(34824) 2001 SY156	3.10	0.19	5.67	299.6	115.1	9.5	2.99	2.02	4.55	13.47±0.07	4	81	17.73±0.02	3.12±0.01	0.15	3
35005*	(35005) 1979 MY3	2.56	0.17	6.56	123.4	232.5	3.8	2.73	1.77	5.73	15.14±0.14	4	77	18.91±0.05	7.27±0.06	0.34	3
35352	(35352) Texas	2.35	0.24	1.58	229.1	76.2	1.3	2.83	1.85	2.11	16.46±0.16	4	50	20.24±0.12	2.54±0.01	0.61	2
35491	(35491) 1998 FQ27	2.57	0.24	4.12	311.0	308.3	3.0	2.95	2.02	7.00	14.46±0.10	4	73	18.82±0.05	3.60±0.03	0.27	3
35545	(35545) 1998 FQ103	2.59	0.12	3.95	283.7	330.6	2.9	2.80	1.84	4.76	14.54±0.13	4	91	18.60±0.04	2.30±0.01	0.20	3
35715	(35715) 1999 FD32	2.47	0.16	3.02	125.8	103.3	2.5	2.54	1.60	7.39	15.18±0.16	4	80	18.69±0.04	8.73±0.08	0.41	3
35863	(35863) 1999 JX67	2.54	0.27	3.98	112.2	184.3	4.8	3.23	2.26	4.10	14.62±0.25	4	70	19.29±0.06	7.74±0.06	0.66	3
35913	(35913) 1999 JC97	3.18	0.16	15.86	115.3	197.0	7.9	3.66	2.68	2.14	13.62±0.14	4	80	18.80±0.05	5.03±0.03	0.29	3
35922	(35922) 1999 JO102	2.53	0.10	3.65	119.8	183.5	3.3	2.77	1.79	2.14	15.40±0.22	4	66	19.10±0.06	5.61±0.03	0.68	3
36035 ^b	(36035) Petrvo	2.57	0.11	14.13	158.3	351.6	5.8	2.29	1.31	5.27	13.49±0.29	4	81	16.24±0.01	7.93±0.07	0.92	3
36109	(36109) 1999 RB122	3.22	0.14	5.33	156.0	170.7	7.4	3.66	2.68	2.28	14.38±0.12	3	50	19.55±0.08	6.49±0.13	0.31	2
36218	(36218) 1999 TK220	2.57	0.18	7.05	342.4	282.2	4.1	2.66	1.67	1.32	14.12±0.21	2	32	17.50±0.02	3.87±0.02	0.50	3
36570	(36570) 2000 QC121	2.54	0.06	5.17	285.0	175.1	3.4	2.40	1.43	6.07	14.95±0.25	4	84	18.07±0.03	6.23±0.04	0.77	3
36877	(36877) 2000 SX152	2.56	0.06	0.67	337.1	47.9	4.1	2.56	1.63	8.34	14.95±0.13	4	72	18.64±0.04	4.80±0.05	0.19	3
36985	(36985) 2000 SH349	2.56	0.10	11.23	120.4	30.3	2.2	2.36	1.38	4.14	15.01±0.17	4	53	17.84±0.02	5.42±0.15	0.10	2
37040	(37040) 2000 UP22	2.53	0.04	4.55	164.6	22.2	2.2	2.44	1.45	1.02	15.08±0.09	4	80	18.02±0.02	2.15±0.01	0.22	2
37451	(37451) 4280 P-L	2.52	0.10	2.28	342.5	300.4	3.0	2.76	1.83	8.04	15.61±0.13	4	75	19.69±0.08	3.11±0.02	0.33	2
37928	(37928) 1998 FO121	2.55	0.10	2.28	154.9	77.0	2.3	2.48	1.50	1.46	15.08±0.09	4	86	18.13±0.03	3.05±0.02	0.12	2
37947	(37947) 1998 HJ20	2.56	0.03	1.90	212.9	116.1	3.5	2.63	1.64	1.96	15.28±0.13	4	78	18.61±0.04	5.96±0.04	0.30	3
38001	(38001) 1998 KM37	2.65	0.25	3.86	115.2	168.1	5.2	3.27	2.31	3.99	14.43±0.26	4	78	19.33±0.07	5.61±0.03	0.87	3
38012	(38012) 1998 KE54	2.60	0.16	16.11	147.8	142.0	2.8	2.87	1.88	1.10	14.51±0.08	4	87	18.30±0.03	2.67±0.01	0.15	3
38052	(38052) 1998 XA7	5.25	0.03	1.81	147.7	266.4	16.7	5.28	4.30	0.81	12.64±0.21	4	89	19.62±0.08	8.21±0.07	0.63	3
38238*	(38238) Holic	2.58	0.32	6.50	162.8	172.5	4.1	3.39	2.40	1.15	14.96±0.16	4	72	19.57±0.08	11.71±0.14	0.57	2
38270	(38270) Wettzell	2.55	0.25	14.54	320.0	318.1	4.0	2.89	1.93	5.04	15.00±0.19	2	23	19.12±0.05	8.28±1.23	0.52	2
38653	(38653) 2000 OT22	2.57	0.25	3.64	95.0	275.6	4.1	2.70	1.80	10.49	14.96±0.26	4	74	19.04±0.05	4.95±0.03	0.77	3
38798	(38798) 2000 RB54	2.61	0.01	3.21	127.8	166.2	5.1	2.63	1.65	2.80	14.47±0.33	4	72	18.12±0.03	12.47±0.16	0.80	3
38837	(38837) 2000 SM23	2.59	0.17	10.32	145.3	289.6	4.6	2.42	1.43	1.16	14.41±0.10	4	76	17.27±0.01	16.84±0.30	0.21	3

Table 2—Continued

Obj ID	Designation	a	e	i	Ω	ω	D	Δ	r	α	H_R	n	m	PTF_R	Period (hr)	Δm	U
38872	(38872) 2000 SP116	3.22	0.16	1.50	158.8	215.6	8.5	3.53	2.55	1.35	13.94±0.14	4	83	18.94±0.05	6.27±0.04	0.32	3
38984	(38984) 2000 UZ4	3.32	0.24	0.49	59.7	357.8	6.1	3.21	2.22	0.53	14.84±0.19	4	74	19.20±0.06	19.20±0.39	0.70	2
39008	(39008) 2000 UU41	2.58	0.09	0.96	72.0	4.8	4.0	2.42	1.49	9.91	15.00±0.09	4	76	18.35±0.03	2.49±0.01	0.16	3
39086	(39086) 2000 VG41	2.57	0.07	2.45	285.8	238.8	3.2	2.45	1.48	4.03	15.51±0.10	4	78	18.64±0.04	6.11±0.11	0.20	2
39283	(39283) 2001 BN45	2.58	0.18	14.16	109.8	293.1	3.2	2.38	1.43	7.46	14.23±0.03	2	55	17.40±0.01	2.87±0.03	0.11	2
39293	(39293) 2001 DQ10	5.23	0.04	14.41	153.0	236.3	22.9	5.34	4.35	0.99	11.96±0.09	4	74	18.83±0.05	2.97±0.03	0.15	2
40036	(40036) 1998 KT19	2.58	0.21	5.02	144.1	130.7	2.4	2.83	1.84	2.11	15.22±0.24	2	31	18.91±0.07	6.67±0.09	0.59	3
40228	(40228) 1998 TR1	2.70	0.23	12.73	115.9	179.5	3.7	3.31	2.36	5.19	14.04±0.15	4	81	18.91±0.05	3.40±0.02	0.28	3
40654	(40654) 1999 RH191	2.59	0.14	5.12	95.0	169.7	3.7	2.88	1.92	5.54	15.19±0.21	1	25	19.33±0.06	6.62±0.43	0.77	2
40891	(40891) 1999 TH136	2.64	0.09	2.54	343.7	23.0	3.3	2.82	1.84	1.90	15.33±0.14	4	85	19.09±0.05	3.10±0.02	0.25	2
41249	(41249) 1999 XJ40	2.65	0.10	2.21	291.9	31.8	3.8	2.91	1.93	2.96	15.08±0.12	4	74	19.10±0.06	11.03±0.13	0.36	3
41531	(41531) 2000 RN9	2.61	0.18	4.44	105.2	299.6	3.3	2.45	1.54	11.09	14.89±0.33	4	70	18.65±0.03	5.55±0.03	1.07	3
41532	(41532) 2000 RO9	2.61	0.17	4.81	165.9	300.0	2.8	2.24	1.27	4.98	14.61±0.11	4	92	17.26±0.01	5.85±0.04	0.25	3
41881	(41881) 2000 WH109	2.61	0.12	5.48	298.9	120.6	3.5	2.41	1.45	6.51	15.29±0.13	3	67	18.64±0.04	3.24±0.01	0.28	3
42259	(42259) 2001 OD81	2.99	0.12	9.84	327.1	13.3	9.9	3.35	2.36	0.59	12.52±0.13	4	84	17.16±0.01	4.82±0.02	0.32	3
42307	(42307) 2001 VC48	2.40	0.20	2.83	131.2	163.3	2.8	2.74	1.76	1.12	14.81±0.08	4	83	18.38±0.03	6.11±0.08	0.13	2
42379	(42379) 2013 P-L	2.20	0.23	4.07	334.0	346.3	2.2	2.65	1.71	7.89	15.43±0.26	4	62	19.22±0.06	5.33±0.03	0.82	3
42526	(42526) 1994 PA36	2.66	0.09	2.23	165.8	156.2	4.4	2.90	1.91	2.19	14.80±0.10	4	78	18.68±0.04	10.32±0.11	0.28	2
42904 ^b	(42904) 1999 RV202	2.64	0.06	9.85	295.0	279.0	3.8	2.66	1.69	2.98	15.11±0.27	3	64	18.58±0.03	4.64±0.02	0.85	3
42939	(42939) 1999 TJ31	2.67	0.02	1.24	339.6	208.7	3.1	2.65	1.67	3.50	14.44±0.16	3	54	17.99±0.02	4.97±0.05	0.27	2
42970	(42970) 1999 TD174	2.63	0.11	3.62	135.2	162.2	2.8	2.84	1.85	0.76	14.97±0.28	4	79	18.63±0.04	18.46±0.35	0.72	2
43526	(43526) 2001 DD37	2.64	0.10	4.30	152.5	173.8	3.5	2.89	1.90	1.03	15.22±0.29	4	85	19.16±0.06	8.07±0.07	0.93	3
43934	(43934) 1996 TC	3.02	0.05	0.55	338.1	134.9	8.0	2.89	1.93	5.91	13.98±0.17	3	55	17.99±0.02	3.60±0.01	0.23	3
43963	(43963) 1997 EW14	2.25	0.19	5.44	169.8	200.5	1.5	2.51	1.54	4.63	15.75±0.13	4	73	19.05±0.06	6.81±0.05	0.29	3
44400 ^b	(44400) 1998 ST97	2.73	0.11	5.09	173.7	138.9	5.0	3.02	2.05	4.13	14.88±0.27	4	77	19.20±0.05	10.55±0.12	0.89	3
44578	(44578) 1999 GL25	2.44	0.08	5.50	147.2	290.8	5.6	2.37	1.39	1.97	15.02±0.12	4	81	17.70±0.02	3.74±0.01	0.34	3
44694	(44694) 1999 RT234	2.20	0.08	4.97	106.5	105.2	2.3	2.19	1.26	10.68	15.24±0.12	4	79	18.03±0.03	2.87±0.02	0.28	3
44834	(44834) 1999 TE256	2.21	0.02	3.05	256.3	221.4	1.6	2.16	1.18	5.29	16.04±0.20	2	28	18.44±0.04	5.42±0.06	0.63	2
44873	(44873) 1999 UF41	2.26	0.15	6.11	116.3	295.4	1.6	2.09	1.14	9.61	15.93±0.13	4	74	18.31±0.03	2.74±0.01	0.24	2
44938	(44938) 1999 VV50	2.23	0.17	2.65	266.8	70.3	2.5	2.60	1.62	3.74	15.26±0.26	4	76	18.69±0.04	3.97±0.02	0.68	3
44997	(44997) 1999 VX184	2.24	0.19	2.97	106.0	224.3	3.8	2.56	1.59	4.71	16.26±0.14	4	73	19.69±0.09	3.34±0.03	0.38	2
45016	(45016) 1999 WV2	2.75	0.09	10.18	111.7	6.0	3.7	2.50	1.53	4.98	14.22±0.11	4	82	17.51±0.02	2.87±0.02	0.16	2

Table 2—Continued

Obj ID	Designation	a	e	i	Ω	ω	D	Δ	r	α	H_R	n	m	PTF_R	Period (hr)	Δm	U
45058	(45058) 1999 XR29	2.26	0.18	4.35	99.2	246.8	1.9 ^W	2.50	1.55	8.24	15.63±0.13	4	66	19.11±0.06	6.58±0.05	0.38	3
45349	(45349) 2000 AP93	2.26	0.17	4.23	106.3	293.6	2.2	2.10	1.13	6.89	15.34±0.14	4	74	17.71±0.02	6.44±0.04	0.13	3
45628	(45628) 2000 DD99	2.84	0.08	1.89	23.7	23.7	5.4	2.74	1.79	6.60	15.09±0.16	4	88	19.01±0.05	3.48±0.01	0.31	2
45721	(45721) 2000 GZ42	3.81	0.07	1.02	48.0	310.1	13.0	4.06	3.08	1.13	13.18±0.22	4	77	18.82±0.04	6.00±0.04	0.71	3
45876	(45876) 2000 WD27	2.19	0.10	4.53	97.6	134.4	3.1	2.25	1.31	9.23	14.58±0.13	3	50	17.51±0.02	3.87±0.02	0.12	3
46108	(46108) 2001 FW18	2.24	0.18	2.03	281.9	57.0	1.9	2.64	1.66	3.32	15.66±0.10	4	69	19.10±0.06	3.06±0.05	0.20	2
46452	(46452) 3097 P-L	2.80	0.20	7.04	293.6	358.5	8.6 ^W	3.35	2.40	5.23	14.11±0.24	4	70	19.01±0.06	20.43±1.39	0.63	2
46506	(46506) 3387 T-3	2.16	0.21	1.64	8.4	291.1	1.5	2.49	1.50	1.83	16.11±0.20	2	26	19.21±0.07	9.32±0.28	0.76	2
46758	(46758) 1998 FQ59	2.20	0.12	3.39	132.8	54.2	1.6	2.10	1.13	4.67	15.95±0.21	4	72	18.19±0.03	3.13±0.01	0.49	3
47195	(47195) 1999 TG179	2.25	0.19	2.62	321.0	189.1	1.5	1.88	0.92	10.55	16.09±0.05	3	57	17.87±0.02	2.68±0.02	0.11	2
47386	(47386) 1999 XX101	2.79	0.10	6.12	296.3	284.6	6.8 ^W	2.84	1.87	3.88	13.06±0.13	4	79	17.02±0.01	8.42±0.07	0.12	3
47392	(47392) 1999 XT109	2.27	0.19	5.09	90.7	316.7	1.8	2.06	1.11	10.21	15.69±0.06	1	27	18.09±0.02	5.27±0.44	0.10	2
47496	(47496) 2000 AU43	2.30	0.17	2.09	97.7	258.0	2.0 ^W	2.47	1.54	9.11	15.17±0.07	4	65	18.64±0.04	4.02±0.05	0.15	2
47691	(47691) 2000 CT92	2.85	0.03	2.23	29.0	68.7	5.3 ^W	2.79	1.89	10.00	13.28±0.19	3	64	17.65±0.02	3.87±0.02	0.54	3
47780	(47780) 2000 EM13	2.79	0.06	1.96	233.4	4.5	3.2 ^W	2.78	1.81	4.25	14.52±0.08	4	76	18.35±0.03	2.53±0.01	0.16	2
47856	(47856) 2000 EO154	2.92	0.08	2.03	354.2	27.1	4.5 ^W	2.92	1.96	4.85	13.87±0.09	4	71	18.06±0.02	2.72±0.06	0.14	2
47990	(47990) 2000 YV68	2.20	0.09	3.53	129.3	12.9	1.5	2.01	1.02	1.69	16.06±0.08	4	87	17.81±0.02	6.32±0.04	0.12	2
48103	(48103) 2001 FP66	2.21	0.07	7.98	152.5	333.0	1.6	2.07	1.08	1.00	16.06±0.10	4	86	17.85±0.02	4.97±0.03	0.22	3
48190	(48190) 2001 HA53	2.28	0.13	5.89	174.9	178.6	2.1	2.52	1.55	4.40	15.36±0.07	4	79	18.69±0.04	2.40±0.01	0.16	2
48267	(48267) 2001 YA118	2.52	0.13	1.48	315.3	119.4	2.2 ^W	2.26	1.30	7.31	15.17±0.22	4	81	18.00±0.02	8.21±0.07	0.52	3
48282	(48282) 2002 FA22	2.58	0.03	13.48	150.5	225.3	5.5 ^W	2.63	1.65	3.20	14.84±0.13	4	74	18.26±0.03	10.00±0.11	0.38	3
48353	(48353) 6616 P-L	2.81	0.10	1.94	171.9	226.0	6.7 ^W	2.89	1.90	1.88	14.78±0.14	4	95	18.70±0.04	9.80±0.10	0.34	3
48660	(48660) 1995 WA5	2.33	0.25	1.11	155.8	275.9	1.8	1.84	0.87	6.10	15.70±0.03	1	29	17.15±0.01	2.82±0.09	0.11	2
48663	(48663) 1995 WY7	2.30	0.26	4.44	347.4	27.5	2.3 ^W	2.69	1.70	1.55	14.95±0.15	4	88	18.54±0.04	6.23±0.04	0.38	3
48721	(48721) 1996 UJ2	2.97	0.10	9.03	334.2	33.7	6.5 ^W	3.20	2.21	0.71	13.66±0.19	4	87	18.00±0.02	5.36±0.03	0.63	3
48727	(48727) 1997 AL18	2.27	0.11	10.17	111.3	180.3	1.9	2.52	1.54	2.33	15.66±0.11	3	66	18.83±0.05	3.22±0.02	0.27	3
48734	(48734) 1997 CZ16	2.28	0.05	6.25	310.6	135.4	2.2 ^W	2.19	1.26	10.95	15.18±0.16	4	71	18.06±0.03	6.44±0.04	0.35	3
48882	(48882) 1998 HJ139	2.23	0.15	6.79	125.6	146.8	1.3	2.54	1.57	3.33	16.50±0.25	4	55	19.91±0.11	6.96±0.05	0.73	2
48935 ^b	(48935) 1998 QK1	2.30	0.14	6.45	310.6	39.9	2.4 ^W	2.58	1.60	3.82	15.01±0.25	4	78	18.37±0.03	5.39±0.03	0.67	3
48944	(48944) 1998 QT13	2.32	0.25	2.24	149.6	246.5	1.9 ^W	2.46	1.47	0.57	15.35±0.14	4	95	18.28±0.03	4.30±0.02	0.41	3
48969	(48969) 1998 QT38	2.34	0.14	3.95	283.6	108.2	2.7 ^W	2.24	1.26	3.28	15.42±0.14	3	58	17.98±0.03	3.25±0.01	0.32	3
48981	(48981) 1998 QD45	2.34	0.13	5.61	283.4	113.5	3.7 ^W	2.24	1.28	6.15	14.17±0.21	4	84	17.00±0.01	7.01±0.05	0.54	3

Table 2—Continued

Obj ID	Designation	a	e	i	Ω	ω	D	Δ	r	α	H_R	n	m	PTF_R	Period (hr)	Δm	U
49155	(49155) 1998 SZ53	2.33	0.12	3.77	321.5	44.8	4.2	2.42	1.48	9.03	14.48±0.16	4	76	17.93±0.02	2.62±0.01	0.44	3
49603	(49603) 1999 FC25	3.03	0.05	4.24	94.0	35.6	8.2	2.88	1.93	5.69	13.77±0.04	1	27	17.92±0.02	5.08±0.26	0.15	2
49795	(49795) 1999 XJ32	2.29	0.15	3.76	150.2	323.1	5.9	2.00	1.01	0.94	15.14±0.19	4	86	16.74±0.01	6.00±0.04	0.45	3
49910	(49910) 1999 XS169	2.28	0.13	4.07	325.2	185.3	2.8	1.97	0.99	3.42	14.91±0.10	4	80	16.72±0.01	2.75±0.01	0.12	2
50016	(50016) 2000 AT32	2.30	0.07	2.18	49.9	277.7	2.1	2.44	1.50	8.66	15.30±0.13	4	74	18.75±0.04	2.92±0.03	0.20	2
50329	(50329) 2000 CK56	2.34	0.13	7.39	120.2	246.2	2.5	2.41	1.45	6.44	14.67±0.08	4	84	17.81±0.02	7.06±0.16	0.14	2
50399	(50399) 2000 CQ102	2.80	0.12	2.12	307.2	252.4	6.4	2.57	1.59	2.96	14.35±0.09	4	78	17.68±0.02	3.42±0.02	0.13	2
50433	(50433) 2000 DC22	2.74	0.26	8.85	148.6	173.9	6.4	3.42	2.43	1.97	14.53±0.13	4	76	19.33±0.06	8.42±0.07	0.32	3
50596	(50596) 2000 EV47	2.86	0.08	1.64	331.5	32.8	4.6	3.04	2.05	0.40	13.28±0.08	4	87	17.22±0.01	2.89±0.02	0.08	2
50648	(50648) 2000 EL89	2.85	0.03	3.14	100.9	191.2	4.1	2.93	2.01	8.21	14.65±0.11	4	68	19.15±0.06	4.80±0.07	0.19	2
50811 ^b	(50811) 2000 FZ29	2.87	0.06	2.23	169.6	174.7	3.6	3.05	2.06	1.73	14.65±0.16	4	91	18.74±0.05	5.16±0.03	0.42	3
51458	(51458) 2001 FL42	2.25	0.14	1.14	335.2	296.6	1.4	2.52	1.58	7.52	16.28±0.19	2	30	19.79±0.09	6.23±0.42	0.58	2
51780 ^b	(51780) 2001 MB9	2.96	0.12	9.05	310.9	86.0	4.9	2.90	1.98	8.36	14.51±0.26	4	73	18.77±0.04	5.82±0.04	0.78	3
51937	(51937) 2001 QD159	3.00	0.11	2.80	149.9	282.8	8.3	2.88	1.90	2.84	14.05±0.23	2	38	17.97±0.02	6.62±0.05	0.70	3
51987	(51987) 2001 SV179	2.93	0.07	1.62	2.2	99.6	6.8	2.78	1.79	0.83	14.61±0.11	4	98	18.24±0.03	2.82±0.01	0.22	3
52046	(52046) 2002 PH83	2.25	0.20	3.01	119.5	210.7	1.3	2.60	1.64	6.21	16.47±0.14	4	63	20.09±0.11	4.23±0.06	0.49	2
52179	(52179) 2270 T-2	2.87	0.04	1.34	208.8	81.7	4.7	2.99	2.02	4.15	15.39±0.24	4	75	19.64±0.08	4.97±0.03	0.81	3
52235	(52235) 1979 MW2	3.04	0.14	3.64	167.5	202.0	10.4	3.33	2.35	2.69	14.23±0.22	4	76	19.01±0.05	8.28±0.07	0.75	3
52353	(52353) 1993 FP19	3.07	0.09	7.84	148.6	343.5	6.2	2.81	1.82	1.48	14.79±0.07	4	82	18.51±0.04	5.05±0.05	0.16	2
52436	(52436) 1994 PM26	2.35	0.17	12.66	335.2	38.0	2.4	2.60	1.61	1.62	14.88±0.05	2	38	18.21±0.03	3.58±0.03	0.11	2
52521	(52521) 1996 JU3	2.40	0.11	3.59	100.2	48.7	4.8	2.15	1.21	10.33	15.34±0.09	4	78	18.07±0.02	3.49±0.01	0.14	3
52522	(52522) 1996 JW10	2.41	0.17	3.21	122.0	126.2	1.9	2.66	1.69	4.80	15.59±0.18	3	64	19.22±0.06	9.32±0.18	0.57	3
52549	(52549) 1996 XB31	3.17	0.05	10.30	122.4	1.0	8.1	3.01	2.06	6.13	13.84±0.13	4	77	18.27±0.03	14.33±0.44	0.19	2
52696	(52696) 1998 FC51	3.13	0.12	2.51	123.4	50.3	6.0	2.88	1.93	6.11	14.87±0.14	4	75	19.13±0.06	4.29±0.02	0.33	3
52709	(52709) 1998 FA84	3.07	0.11	12.37	144.1	301.7	4.8	2.92	1.93	1.37	14.19±0.13	4	83	18.10±0.03	15.48±0.25	0.36	3
52776	(52776) 1998 QS19	2.33	0.17	1.40	272.6	83.6	1.4	2.46	1.49	5.25	16.34±0.16	2	48	19.54±0.07	7.16±0.05	0.52	3
52819	(52819) 1998 QK104	2.32	0.16	5.82	131.6	184.5	2.3	2.65	1.68	3.38	15.21±0.13	4	63	18.75±0.05	3.95±0.08	0.38	2
53300	(53300) 1999 GD31	3.00	0.25	2.90	143.0	7.6	6.2	2.36	1.38	3.90	14.81±0.15	4	85	17.71±0.02	3.86±0.03	0.13	3
53465	(53465) 1999 XY222	2.28	0.05	5.37	334.5	176.9	2.0	2.17	1.18	1.74	15.64±0.09	4	84	17.75±0.02	5.05±0.05	0.13	2
53531	(53531) 2000 AD212	2.31	0.13	9.00	145.2	135.8	2.5	2.48	1.49	1.74	15.00±0.09	4	81	18.06±0.03	2.69±0.02	0.11	2
53620	(53620) 2000 CN93	2.36	0.21	4.87	103.1	158.6	3.1	2.69	1.76	8.68	14.48±0.20	4	66	18.43±0.04	3.16±0.01	0.61	3
53639	(53639) 2000 DJ13	2.31	0.17	6.99	329.6	352.6	2.5	2.69	1.70	0.62	15.00±0.20	4	78	18.32±0.03	5.11±0.03	0.56	3

Table 2—Continued

Obj ID	Designation	a	e	i	Ω	ω	D	Δ	r	α	H_R	n	m	PTF_R	Period (hr)	Δm	U
53734	(53734) 2000 EB46	2.34	0.13	6.54	347.2	61.2	2.7	2.39	1.41	2.74	14.77 \pm 0.11	2	33	17.85 \pm 0.02	5.05 \pm 0.03	0.31	3
54076	(54076) 2000 GL154	2.38	0.13	5.44	293.8	84.7	2.1	2.39	1.43	7.24	15.38 \pm 0.14	4	67	18.54 \pm 0.04	4.95 \pm 0.05	0.25	2
54376 ^b	(54376) 2000 KV56	2.41	0.16	3.55	93.5	170.7	1.9	2.73	1.76	4.39	15.57 \pm 0.23	4	76	19.37 \pm 0.07	4.17 \pm 0.02	0.71	3
54397	(54397) 2000 KC80	2.37	0.13	5.27	153.2	0.4	1.8	2.05	1.07	1.33	15.52 \pm 0.19	4	80	17.30 \pm 0.01	7.33 \pm 0.06	0.55	3
54427	(54427) 2000 LG27	3.05	0.10	8.87	319.4	351.4	7.3	3.33	2.35	1.74	13.42 \pm 0.18	4	85	18.05 \pm 0.03	3.84 \pm 0.02	0.37	3
54537	(54537) 2000 QD49	2.42	0.16	4.30	156.2	80.0	3.4	2.33	1.34	2.21	14.93 \pm 0.12	3	64	17.64 \pm 0.02	2.77 \pm 0.01	0.24	3
54735	(54735) 2001 KW24	2.25	0.10	2.99	310.3	248.7	1.7	2.10	1.12	5.82	15.90 \pm 0.11	3	55	18.31 \pm 0.03	5.36 \pm 0.06	0.15	2
54827*	(54827) 2001 NQ8	2.39	0.21	3.13	84.0	292.8	2.1	2.42	1.50	10.28	15.35 \pm 0.18	4	71	18.74 \pm 0.04	5.85 \pm 0.04	0.54	3
54979	(54979) 2001 PP56	2.36	0.13	2.11	301.5	143.3	4.1	2.20	1.21	1.42	15.96 \pm 0.12	4	81	18.28 \pm 0.03	3.75 \pm 0.03	0.15	2
55097	(55097) 2001 QT132	3.01	0.11	11.23	161.0	200.9	6.0	3.26	2.28	1.90	13.68 \pm 0.16	4	65	18.23 \pm 0.03	4.40 \pm 0.02	0.46	3
55128	(55128) 2001 QH177	2.39	0.12	6.43	282.2	81.9	4.9	2.45	1.47	4.20	15.86 \pm 0.13	4	79	19.00 \pm 0.06	3.00 \pm 0.05	0.18	2
55293	(55293) 2001 SY39	2.35	0.10	6.84	147.1	116.7	1.6	2.42	1.43	1.10	15.96 \pm 0.12	3	59	18.79 \pm 0.04	4.62 \pm 0.09	0.16	2
55340	(55340) 2001 ST125	2.40	0.10	2.13	265.9	216.6	3.9	2.17	1.20	3.60	15.98 \pm 0.12	4	78	18.23 \pm 0.03	8.65 \pm 0.16	0.16	3
55384	(55384) 2001 SQ267	2.41	0.14	3.55	118.3	127.4	2.5	2.58	1.63	7.57	14.98 \pm 0.14	4	95	18.67 \pm 0.04	2.57 \pm 0.01	0.19	2
55387	(55387) 2001 SD272	2.38	0.15	1.98	350.5	231.6	2.4	2.38	1.47	11.42	15.08 \pm 0.13	4	72	18.48 \pm 0.03	3.05 \pm 0.01	0.18	3
55728	(55728) 1981 EV17	2.40	0.15	1.79	234.0	22.1	1.6	2.66	1.69	3.91	15.95 \pm 0.28	4	93	19.55 \pm 0.08	9.70 \pm 0.10	0.97	3
55763	(55763) 1992 DO7	3.18	0.08	3.44	104.4	124.9	6.1	3.26	2.30	4.43	14.82 \pm 0.26	3	50	19.56 \pm 0.08	8.21 \pm 0.14	0.74	3
56299	(56299) 1999 RT47	3.21	0.06	6.84	337.8	2.4	10.5	3.41	2.42	1.31	13.49 \pm 0.15	3	59	18.24 \pm 0.03	5.75 \pm 0.03	0.45	3
56313	(56313) 1999 SV14	3.16	0.26	24.98	311.2	300.6	9.6	3.46	2.57	7.79	13.65 \pm 0.18	4	73	18.91 \pm 0.05	8.57 \pm 0.08	0.45	3
56558	(56558) 2000 HK100	2.90	0.02	2.85	145.7	161.5	5.9	2.94	1.95	1.69	14.92 \pm 0.14	4	89	18.94 \pm 0.05	3.56 \pm 0.01	0.24	3
56570	(56570) 2000 JA21	2.38	0.13	3.22	280.0	87.0	2.4	2.60	1.62	4.41	14.94 \pm 0.09	4	76	18.47 \pm 0.04	3.44 \pm 0.01	0.22	2
56633	(56633) 2000 KY8	2.37	0.05	0.56	266.1	111.1	1.3	2.46	1.47	1.06	16.49 \pm 0.14	4	76	19.45 \pm 0.07	2.39 \pm 0.02	0.32	3
56647	(56647) 2000 KG34	2.41	0.14	6.72	157.4	235.8	1.8	2.50	1.52	4.26	15.72 \pm 0.11	4	76	18.94 \pm 0.05	7.38 \pm 0.11	0.32	3
56794	(56794) 2000 OO60	3.20	0.15	5.38	321.5	75.7	7.7	3.07	2.12	5.83	14.01 \pm 0.24	4	76	18.35 \pm 0.03	5.00 \pm 0.03	0.50	3
56875	(56875) 2000 QE111	3.06	0.11	1.82	337.4	340.4	5.5	3.40	2.41	0.77	15.01 \pm 0.19	4	75	19.81 \pm 0.09	5.33 \pm 0.06	0.48	2
56943	(56943) 2000 RF76	3.15	0.18	2.11	136.8	288.0	8.8	3.04	2.06	1.54	14.12 \pm 0.24	1	19	18.33 \pm 0.04	6.81 \pm 0.19	0.71	2
56958	(56958) 2000 ST28	3.18	0.03	13.06	337.9	158.6	12.2	3.08	2.09	1.18	13.96 \pm 0.14	4	83	18.17 \pm 0.03	6.49 \pm 0.04	0.33	3
57035	(57035) 2000 WG54	2.52	0.10	2.25	351.1	262.2	3.6	2.53	1.54	1.47	14.33 \pm 0.16	3	55	17.65 \pm 0.02	4.34 \pm 0.02	0.26	2
57364	(57364) 2001 RU27	2.42	0.17	0.76	347.8	76.6	1.5	2.11	1.13	4.46	16.27 \pm 0.13	4	71	18.47 \pm 0.04	11.16 \pm 0.27	0.25	3
57368	(57368) 2001 RP44	3.16	0.30	14.43	152.0	252.3	7.9	3.10	2.12	2.17	14.18 \pm 0.09	4	78	18.49 \pm 0.04	10.11 \pm 0.21	0.16	2
57490 ^b	(57490) 2001 ST175	2.41	0.16	3.18	127.9	41.1	2.0	2.15	1.19	6.68	15.75 \pm 0.23	4	81	18.29 \pm 0.03	8.21 \pm 0.07	0.74	3
57670	(57670) 2001 UB30	3.16	0.24	7.91	107.0	303.2	7.0	2.75	1.81	7.10	14.78 \pm 0.12	4	78	18.76 \pm 0.04	6.32 \pm 0.08	0.22	2

Table 2—Continued

Obj ID	Designation	a	e	i	Ω	ω	D	Δ	r	α	H_R	n	m	PTF_R	Period (hr)	Δm	U
57689	(57689) 2001 UM73	2.40	0.16	2.71	75.2	151.9	2.1	2.47	1.51	6.38	15.43±0.18	3	52	18.87±0.05	19.59±0.83	0.36	2
57708	(57708) 2001 UV119	3.20	0.17	2.01	76.2	29.0	7.9	2.67	1.71	6.48	14.27±0.16	4	80	18.03±0.03	11.85±0.14	0.40	3
57721	(57721) 2001 UK139	2.36	0.14	2.41	168.7	68.0	1.4	2.30	1.32	3.17	16.35±0.10	4	75	19.04±0.05	5.00±0.05	0.20	2
57822	(57822) 2001 WV45	2.40	0.14	1.75	354.5	243.8	2.0	2.35	1.36	1.79	15.49±0.09	2	39	18.25±0.03	8.07±0.33	0.14	2
58049	(58049) 2002 XY86	2.34	0.05	6.31	309.4	179.6	1.5	2.23	1.31	11.25	16.20±0.18	4	77	19.20±0.06	5.36±0.03	0.51	3
58055	(58055) 2003 AH6	2.39	0.22	7.23	294.2	84.2	2.2	2.34	1.38	6.86	15.24±0.08	3	34	18.29±0.03	2.87±0.02	0.15	2
58544	(58544) 1997 EK42	3.19	0.09	5.02	319.1	270.5	8.6	3.12	2.14	1.90	14.19±0.16	4	99	18.49±0.03	10.11±0.11	0.34	3
58658	(58658) 1997 WY57	2.44	0.13	6.55	173.3	197.3	1.8	2.65	1.67	3.68	15.78±0.12	4	74	19.31±0.06	4.95±0.03	0.33	3
58703	(58703) 1998 BH44	2.46	0.25	3.07	113.4	247.5	5.1	2.96	1.98	1.10	14.48±0.06	4	84	18.44±0.03	5.25±0.06	0.14	2
58871	(58871) 1998 HX114	2.56	0.16	12.44	153.9	98.2	2.3	2.53	1.55	2.03	15.18±0.17	4	79	18.24±0.03	4.53±0.02	0.46	3
59057	(59057) 1998 UO18	2.37	0.22	2.24	2.2	13.5	1.8	2.43	1.53	11.54	15.73±0.27	4	64	19.26±0.06	5.39±0.03	0.89	3
59143	(59143) 1998 XT72	2.85	0.14	11.56	319.8	96.6	4.8	2.82	1.83	2.01	13.82±0.11	4	79	17.55±0.02	2.41±0.01	0.15	3
59180	(59180) 1999 AP12	2.42	0.14	0.82	279.1	276.4	1.3	2.33	1.36	3.77	16.51±0.26	3	44	19.39±0.09	7.74±0.06	0.80	3
59186	(59186) 1999 AK16	2.41	0.18	1.58	322.5	329.1	1.3	2.83	1.91	8.35	16.41±0.22	4	27	20.60±0.15	4.68±0.09	0.67	2
59238	(59238) 1999 CN2	2.40	0.17	1.93	141.2	274.6	2.0	2.38	1.39	0.60	15.33±0.09	4	81	18.08±0.02	2.64±0.01	0.14	2
59255	(59255) 1999 CB26	2.43	0.16	1.70	138.8	309.5	2.1	2.07	1.10	6.47	15.74±0.13	3	54	17.77±0.02	7.33±0.06	0.29	3
59271	(59271) 1999 CG38	2.43	0.16	1.73	317.5	185.5	1.4	2.07	1.13	10.95	16.35±0.13	4	90	18.89±0.05	4.85±0.05	0.29	2
59326	(59326) 1999 CO98	2.41	0.15	4.79	347.0	213.1	2.0	2.13	1.14	1.96	15.52±0.11	4	93	17.66±0.02	3.36±0.01	0.10	2
59345*	(59345) 1999 CK135	2.43	0.14	5.90	334.4	13.5	2.4	2.75	1.76	0.46	15.08±0.13	4	83	18.54±0.03	6.19±0.04	0.32	3
59555	(59555) 1999 JE41	2.55	0.21	4.69	118.8	199.7	4.2	3.03	2.09	6.50	14.91±0.15	4	66	19.50±0.09	5.39±0.06	0.53	2
59778	(59778) 1999 NO39	2.59	0.20	8.21	325.7	25.0	3.9	3.07	2.08	0.85	15.06±0.29	4	73	19.19±0.06	5.52±0.03	0.79	3
59939	(59939) 1999 RW192	3.18	0.17	14.27	152.9	119.0	7.1	3.46	2.49	3.71	14.58±0.12	4	69	19.60±0.07	4.17±0.04	0.34	2
60048	(60048) 1999 TS104	2.23	0.16	3.08	316.7	6.7	3.6	2.54	1.60	7.83	16.10±0.10	3	58	19.64±0.08	7.16±0.16	0.31	2
60091	(60091) 1999 TG156	2.70	0.11	4.15	127.4	216.1	3.6	2.88	1.92	4.60	14.13±0.10	4	99	18.22±0.03	3.60±0.03	0.16	2
60099 ^b	(60099) 1999 TW173	2.70	0.10	3.06	142.2	210.0	3.7	2.83	1.85	3.45	14.31±0.15	4	79	18.32±0.03	9.23±0.09	0.39	3
60271	(60271) 1999 XN56	2.25	0.22	1.70	93.4	232.8	1.4	2.67	1.72	7.38	16.24±0.15	4	53	20.18±0.13	5.82±0.10	0.48	2
60403	(60403) 2000 BK30	2.77	0.08	6.67	140.1	280.7	5.2	2.77	1.78	1.56	14.97±0.15	4	79	18.62±0.04	2.94±0.01	0.31	2
60679 ^b	(60679) 2000 GE24	2.92	0.12	1.40	356.7	27.2	6.4	2.92	1.97	6.66	14.72±0.26	4	99	18.97±0.05	5.55±0.03	0.87	3
60853	(60853) 2000 HZ65	2.37	0.15	3.50	203.2	72.0	1.4	2.55	1.57	4.12	16.21±0.13	2	38	19.60±0.07	12.97±0.55	0.46	2
61195	(61195) Martinoli	2.39	0.21	3.99	352.7	255.6	2.0	2.30	1.32	2.29	15.52±0.18	4	83	18.15±0.03	3.20±0.01	0.44	3
61233	(61233) 2000 ON15	2.51	0.15	3.12	120.3	241.5	2.7	2.59	1.62	3.57	14.99±0.10	3	68	18.40±0.03	8.89±0.25	0.13	2
61631	(61631) 2000 QX102	2.57	0.17	8.41	115.6	279.6	5.7	2.40	1.42	3.21	14.68±0.10	2	51	17.56±0.02	4.03±0.07	0.22	3

Table 2—Continued

Obj ID	Designation	a	e	i	Ω	ω	D	Δ	r	α	H_R	n	m	PTF_R	Period (hr)	Δm	U
61774	(61774) 2000 QV171	3.15	0.15	8.62	339.9	25.8	8.7	3.51	2.52	0.79	14.58±0.26	4	100	19.26±0.06	9.14±0.09	0.76	3
62209	(62209) 2000 SF61	2.55	0.11	2.82	91.8	254.8	2.8	2.70	1.72	3.71	15.76±0.15	3	56	19.43±0.07	7.56±0.12	0.34	2
63158	(63158) 2000 YA4	2.65	0.02	1.32	207.9	319.7	2.1	2.62	1.65	4.67	16.38±0.19	4	67	19.71±0.08	12.80±0.17	0.66	2
63235	(63235) 2001 BV20	3.55	0.04	6.73	121.3	16.1	10.2	3.42	2.46	3.95	13.72±0.13	4	80	18.78±0.04	4.49±0.02	0.34	3
63578	(63578) 2001 QD28	2.43	0.17	2.00	161.2	249.8	6.7	2.41	1.42	3.53	14.73±0.16	3	58	17.70±0.02	7.50±0.06	0.47	3
63679	(63679) 2001 QN145	2.41	0.15	0.99	194.8	243.4	1.1	2.23	1.25	5.19	16.80±0.21	4	87	19.43±0.06	3.78±0.01	0.65	3
63702	(63702) 2001 QK182	2.47	0.14	7.00	123.1	253.2	2.9	2.46	1.48	3.26	14.70±0.11	4	72	17.73±0.02	4.66±0.13	0.14	2
63728	(63728) 2001 QW237	2.42	0.18	2.31	160.7	273.7	1.5	2.22	1.24	4.91	16.10±0.07	2	41	18.71±0.04	6.00±0.18	0.17	2
63894	(63894) 2001 SN5	2.42	0.17	1.06	248.2	178.9	1.3	2.28	1.31	6.42	16.42±0.21	1	19	19.20±0.05	8.57±0.83	0.60	2
63913	(63913) 2001 SG32	3.10	0.12	2.57	91.3	357.1	4.9	2.79	1.87	9.11	15.30±0.24	4	73	19.29±0.06	8.28±0.07	0.89	3
64246	(64246) 2001 TC160	3.08	0.10	11.10	112.2	242.7	5.6	3.27	2.37	8.16	13.95±0.07	2	51	18.87±0.05	4.12±0.04	0.24	2
64889	(64889) 2001 YA76	2.44	0.22	2.39	9.8	356.1	1.4	2.87	1.88	2.30	16.24±0.16	4	61	20.19±0.12	5.71±0.07	0.61	2
64918	(64918) 2001 YB99	3.18	0.09	1.66	151.4	356.2	5.4	2.90	1.92	2.78	15.10±0.14	4	74	18.96±0.05	5.55±0.03	0.34	3
65109	(65109) 2002 CV36	5.15	0.03	12.64	148.6	285.9	21.8	5.12	4.13	0.35	12.07±0.28	4	78	18.71±0.04	9.41±0.09	0.77	3
65116	(65116) 2002 CH51	3.27	0.04	2.30	100.4	158.9	7.7	3.30	2.31	1.24	14.32±0.14	4	85	18.81±0.04	15.24±0.25	0.32	2
65395	(65395) 2002 RY63	2.79	0.20	9.21	154.4	157.7	4.4	3.31	2.32	2.06	15.24±0.19	4	62	19.89±0.10	15.48±0.25	0.54	2
65619	(65619) 4218 T-3	2.33	0.21	3.44	135.9	302.7	1.5	2.10	1.11	1.18	15.94±0.12	4	80	17.91±0.02	6.40±0.04	0.33	3
65795	(65795) 1995 WQ27	3.20	0.17	0.69	14.6	95.1	4.1	2.66	1.69	5.06	15.67±0.11	4	73	19.35±0.06	2.76±0.02	0.23	2
66595	(66595) 1999 RU178	2.55	0.21	9.17	147.5	154.4	2.9	2.93	1.95	2.32	15.14±0.19	4	72	19.07±0.06	5.68±0.03	0.77	3
66625	(66625) 1999 RE205	2.69	0.11	13.55	296.4	149.7	4.0	2.41	1.44	4.64	14.68±0.17	4	71	17.66±0.02	12.97±0.17	0.44	2
66722	(66722) 1999 TC107	2.67	0.12	9.16	291.9	109.5	3.5	2.53	1.55	3.15	14.71±0.22	4	80	17.97±0.03	9.70±0.10	0.58	3
66764	(66764) 1999 TD190	2.64	0.05	9.63	311.8	326.7	3.9	2.73	1.76	4.41	14.59±0.10	4	92	18.29±0.03	12.80±0.17	0.26	3
67209	(67209) 2000 DN26	2.79	0.06	4.91	154.0	270.4	4.9	2.77	1.79	2.14	15.75±0.17	4	69	19.28±0.06	3.78±0.01	0.40	2
67377	(67377) 2000 OW1	3.10	0.07	8.46	293.1	195.2	6.0	2.90	1.94	4.90	13.91±0.11	4	81	18.06±0.03	6.44±0.13	0.16	3
67393	(67393) 2000 OX58	3.21	0.19	0.72	130.4	265.3	5.8	3.04	2.10	6.31	14.32±0.16	4	80	18.88±0.05	15.74±0.26	0.51	3
67413	(67413) 2000 QK50	3.06	0.10	9.38	157.3	116.6	8.1	3.23	2.25	2.92	14.86±0.27	4	74	19.47±0.07	10.91±0.13	0.90	3
67858	(67858) 2000 WX20	2.57	0.09	5.52	109.1	127.4	2.3	2.65	1.72	8.38	15.00±0.18	4	72	18.84±0.04	11.71±0.14	0.40	3
68081	(68081) 2000 YQ97	2.63	0.11	1.22	97.3	14.3	3.0	2.41	1.43	1.53	15.60±0.17	4	82	18.50±0.04	12.97±0.17	0.42	2
68518	(68518) 2001 VM14	2.45	0.04	5.69	314.2	204.0	3.5	2.38	1.43	8.57	14.83±0.12	4	76	18.25±0.03	7.16±0.16	0.12	2
69016	(69016) 2002 UX32	2.23	0.20	4.17	327.6	1.4	2.2	2.69	1.70	0.54	15.32±0.17	4	74	18.74±0.04	4.07±0.02	0.69	3
69068	(69068) 2003 AO32	2.36	0.13	7.05	319.2	59.4	2.0	2.38	1.44	8.79	15.08±0.10	4	69	18.31±0.03	2.87±0.03	0.13	2
69298	(69298) 1992 DR9	2.38	0.11	1.98	246.3	318.7	4.0	2.22	1.24	3.28	16.14±0.14	4	73	18.66±0.04	11.03±0.13	0.28	3

Table 2—Continued

Obj ID	Designation	a	e	i	Ω	ω	D	Δ	r	α	H_R	n	m	PTF_R	Period (hr)	Δm	U
69406 ^{b*}	(69406) 1995 SX48	1.84	0.02	21.99	299.3	308.5	3.2 ⁹	1.87	0.92	11.62	14.41±0.11	4	75	16.29±0.01	4.49±0.04	0.12	2
69758	(69758) 1998 OP10	2.65	0.15	10.32	313.8	292.8	8.8 ²	2.65	1.67	3.67	13.92±0.20	4	70	17.53±0.02	5.85±0.04	0.69	3
70662	(70662) 1999 TR282	2.62	0.13	4.68	159.9	121.3	3.1	2.84	1.87	4.75	15.58±0.14	2	31	19.55±0.09	8.00±0.32	0.42	2
70804	(70804) 1999 VL62	2.70	0.18	2.01	210.8	199.3	3.8 ²	2.68	1.70	3.16	16.17±0.30	3	27	19.73±0.07	6.58±0.04	0.75	3
70867	(70867) 1999 VA150	2.67	0.10	2.96	239.9	132.0	5.7 ²	2.84	1.87	4.25	15.30±0.21	4	66	19.24±0.07	3.79±0.01	0.68	2
70924	(70924) 1999 VC205	2.70	0.04	1.46	203.3	214.1	2.7	2.69	1.71	3.80	15.82±0.11	4	72	19.52±0.08	3.93±0.03	0.23	2
71039	(71039) 1999 XZ73	2.76	0.20	3.40	84.4	347.6	4.6	2.34	1.39	8.15	14.70±0.15	3	57	17.70±0.02	3.23±0.01	0.42	3
71184	(71184) 1999 XJ217	2.75	0.31	0.25	335.7	67.6	2.9	2.76	1.77	0.65	15.73±0.21	4	74	19.36±0.07	4.40±0.02	0.69	3
71434	(71434) 2000 AJ205	2.78	0.17	7.87	315.2	69.3	5.1	2.97	1.99	3.34	14.46±0.27	4	82	18.60±0.04	5.71±0.03	0.84	3
71569	(71569) 2000 DG40	2.33	0.18	1.79	302.7	269.2	1.5	2.31	1.34	5.78	16.12±0.19	4	75	19.02±0.05	2.74±0.01	0.52	3
72179	(72179) 2000 YH113	2.19	0.15	1.73	21.9	358.0	1.7	2.17	1.22	7.71	15.85±0.09	2	46	18.46±0.03	2.99±0.02	0.31	3
72290 ^{b*}	(72290) 2001 BQ15	2.66	0.07	14.86	327.1	275.0	4.4 ²	2.65	1.66	1.89	14.42±0.18	3	62	17.80±0.02	5.65±0.03	0.63	3
72320	(72320) 2001 BW47	2.67	0.05	11.14	327.3	15.9	3.4 ²	2.80	1.82	1.95	14.88±0.08	2	43	18.53±0.03	2.30±0.02	0.16	2
72469	(72469) 2001 DW27	2.71	0.04	2.84	110.8	95.4	2.7 ²	2.71	1.74	4.79	15.24±0.18	4	67	19.00±0.06	13.33±0.18	0.56	2
72918	(72918) 2001 RB134	2.44	0.17	3.18	131.6	273.3	1.3	2.23	1.25	4.93	16.38±0.15	4	75	19.00±0.06	6.15±0.04	0.41	3
73083 ^b	(73083) 2002 GK15	2.55	0.06	3.05	149.5	103.3	2.5	2.56	1.57	1.67	16.03±0.25	4	88	19.32±0.07	6.76±0.05	0.76	3
73664	(73664) 1981 EE34	2.38	0.16	1.99	313.7	210.5	1.2	2.02	1.03	1.53	16.70±0.16	4	69	18.49±0.04	6.15±0.04	0.33	3
73713	(73713) 1992 RW6	2.88	0.06	3.56	94.4	215.9	4.6 ³	3.05	2.10	5.82	13.80±0.12	4	79	18.49±0.03	3.68±0.07	0.13	2
73950	(73950) 1997 TE13	2.86	0.08	1.64	192.5	196.5	5.2	2.94	1.97	4.09	15.20±0.09	4	73	19.45±0.06	13.71±0.40	0.27	2
73964	(73964) 1997 WK42	3.01	0.28	0.78	133.2	265.6	5.6	2.56	1.58	2.39	15.03±0.12	4	73	18.32±0.04	9.80±0.20	0.25	3
74022 ^b	(74022) 1998 HG2	2.18	0.06	3.63	179.0	330.7	1.2	2.05	1.06	3.23	16.58±0.18	3	58	18.63±0.03	5.55±0.03	0.53	3
74108	(74108) 1998 QP37	2.29	0.11	3.36	289.1	277.2	2.8 ²	2.26	1.30	7.46	14.44±0.14	4	83	17.29±0.01	8.73±0.08	0.11	2
74563	(74563) 1999 MQ	2.22	0.20	5.13	281.8	73.4	1.7	2.33	1.36	3.38	15.91±0.10	4	69	18.71±0.05	3.93±0.10	0.16	2
74567	(74567) 1999 NP6	2.20	0.18	1.27	262.4	92.7	1.3 ²	2.52	1.55	4.78	16.21±0.08	4	73	19.51±0.07	10.91±0.39	0.25	2
74737	(74737) 1999 RK180	2.22	0.20	5.37	103.4	236.8	1.8	2.51	1.56	7.52	15.79±0.16	4	73	19.23±0.07	5.30±0.03	0.52	3
75348	(75348) 1999 XF64	2.71	0.08	4.05	184.3	200.2	3.7	2.82	1.83	2.82	15.18±0.18	4	69	19.02±0.05	4.95±0.03	0.54	3
75717	(75717) 2000 AU120	2.76	0.15	8.92	153.2	268.7	4.1	2.71	1.72	0.23	14.96±0.13	2	46	18.42±0.03	3.28±0.04	0.27	2
75974	(75974) 2000 CC117	2.78	0.01	1.76	98.4	88.8	5.3 ²	2.76	1.77	0.96	15.18±0.18	3	52	18.70±0.04	8.14±0.07	0.63	3
76874	(76874) 2000 YR32	2.19	0.18	2.12	297.2	59.6	1.4	2.30	1.32	4.09	16.25±0.10	4	75	18.99±0.06	3.95±0.05	0.23	2
76918	(76918) 2001 AC5	2.18	0.08	3.16	165.3	222.6	1.7	2.26	1.27	2.97	15.86±0.11	4	94	18.50±0.04	2.87±0.01	0.28	3
77689	(77689) 2001 NZ10	2.92	0.09	7.41	332.9	103.7	3.9 ²	2.82	1.83	1.80	14.71±0.10	4	101	18.31±0.03	5.13±0.08	0.16	2
78494	(78494) 2002 RX63	2.27	0.20	4.01	112.1	198.4	1.1	2.68	1.70	3.14	16.84±0.20	4	45	20.41±0.13	6.08±0.15	0.64	2

Table 2—Continued

Obj ID	Designation	a	e	i	Ω	ω	D	Δ	r	α	H_R	n	m	PTF_R	Period (hr)	Δm	U
78996	(78996) 2080 P-L	2.21	0.20	2.25	294.2	81.4	1.4	2.18	1.21	5.88	16.24±0.08	4	90	18.81±0.05	5.05±0.10	0.19	2
79063	(79063) 2499 T-3	2.92	0.07	1.90	334.8	332.1	5.0	3.11	2.15	3.98	15.27±0.17	4	67	19.70±0.10	3.32±0.01	0.61	3
79128	(79128) 1990 SB13	2.39	0.23	0.42	193.0	139.0	1.8	2.79	1.84	5.82	15.78±0.17	4	59	19.78±0.09	4.30±0.08	0.38	2
79272	(79272) 1995 SN6	2.22	0.21	5.77	353.4	293.8	3.5	2.46	1.48	2.94	16.22±0.30	3	50	19.40±0.08	7.74±0.06	0.94	3
79639	(79639) 1998 RP78	2.32	0.12	7.39	150.5	241.5	3.3	2.44	1.45	0.70	14.60±0.16	4	85	17.52±0.01	6.04±0.04	0.43	3
80049	(80049) 1999 JV54	3.10	0.23	1.47	49.9	218.8	6.7	3.67	2.72	4.60	14.43±0.19	4	73	19.82±0.09	4.42±0.04	0.53	3
80055	(80055) 1999 JL70	3.03	0.04	3.81	162.1	27.6	6.8	2.92	1.94	2.45	14.63±0.22	4	74	18.54±0.04	8.28±0.07	0.74	3
80078	(80078) 1999 JU115	3.06	0.17	3.22	78.9	57.9	6.1	2.57	1.62	6.95	14.44±0.13	4	74	18.06±0.02	5.25±0.03	0.26	3
80346	(80346) 1999 XT114	2.24	0.18	8.86	321.3	63.2	2.1	2.42	1.43	2.45	15.66±0.12	4	74	18.69±0.04	3.48±0.03	0.13	2
80381	(80381) 1999 XD160	2.27	0.07	3.96	136.0	300.0	1.8	2.22	1.23	1.24	15.70±0.08	4	82	18.05±0.02	2.61±0.01	0.13	2
80509*	(80509) 2000 AE56	2.31	0.08	2.81	295.6	284.8	2.1	2.35	1.38	4.66	15.42±0.21	4	77	18.44±0.04	3.98±0.02	0.68	3
80516	(80516) 2000 AL59	2.29	0.21	5.44	306.8	320.7	2.4	2.47	1.50	5.75	15.11±0.08	4	72	18.34±0.03	5.89±0.07	0.10	2
80545	(80545) 2000 AD85	2.29	0.16	2.67	166.1	278.8	1.5	2.08	1.09	4.08	15.71±0.10	4	83	17.89±0.02	3.12±0.01	0.16	3
80576	(80576) 2000 AE120	2.31	0.07	2.26	275.4	142.6	1.3	2.22	1.25	6.55	16.37±0.14	4	71	18.92±0.05	2.73±0.02	0.21	2
80672	(80672) 2000 BU17	2.29	0.13	5.42	327.7	113.4	1.6	2.15	1.16	2.88	16.04±0.15	4	83	18.18±0.03	12.31±0.16	0.41	3
80783	(80783) 2000 CR79	2.32	0.14	6.40	162.2	116.2	2.2	2.52	1.54	4.67	15.29±0.21	4	78	18.65±0.04	5.27±0.03	0.68	3
80969	(80969) 2000 DL112	2.32	0.23	1.25	76.7	233.9	2.0	2.79	1.81	0.97	15.48±0.20	4	67	19.12±0.05	14.33±0.22	0.74	3
81205	(81205) 2000 FW10	2.86	0.08	2.24	176.3	160.8	5.5	3.10	2.11	0.63	15.05±0.25	4	77	19.13±0.05	4.95±0.03	0.78	3
81767	(81767) 2000 JV65	3.02	0.14	11.49	114.2	227.9	5.7	3.29	2.33	4.78	13.68±0.28	4	71	18.45±0.04	6.58±0.05	0.64	3
81954	(81954) 2000 PT17	3.15	0.14	2.45	71.7	269.6	5.6	3.44	2.49	4.43	14.41±0.14	4	63	19.49±0.07	3.57±0.03	0.37	2
81957	(81957) 2000 QG14	3.17	0.18	0.39	3.0	349.6	5.0	3.46	2.52	5.82	15.14±0.25	4	46	20.25±0.15	7.27±0.11	0.81	2
82384	(82384) 2001 MV20	2.89	0.09	7.50	359.2	2.4	5.3	3.12	2.13	2.03	14.91±0.12	2	37	19.21±0.07	2.44±0.02	0.21	2
82442	(82442) 2001 ON8	2.30	0.16	2.95	257.7	23.9	1.7	2.53	1.56	4.40	15.83±0.18	4	69	19.22±0.06	6.27±0.04	0.46	2
82593	(82593) 2001 OW90	2.93	0.12	3.79	292.9	64.9	4.3	3.21	2.23	2.79	14.91±0.20	4	65	19.31±0.06	6.00±0.04	0.72	3
82683	(82683) 2001 PZ26	3.05	0.15	0.55	108.6	262.9	5.0	3.14	2.20	6.47	15.03±0.16	3	52	19.67±0.09	4.36±0.08	0.50	2
82753	(82753) 2001 QO7	2.94	0.12	3.24	124.9	247.6	7.1	3.20	2.22	2.46	14.49±0.17	2	22	18.90±0.06	3.62±0.06	0.50	2
83150	(83150) 2001 QA268	3.05	0.14	6.15	321.2	57.3	8.6	3.12	2.23	8.65	14.23±0.15	4	63	19.02±0.06	5.78±0.03	0.47	2
83323	(83323) 2001 RE125	3.02	0.13	9.14	157.9	235.4	5.0	3.15	2.16	1.51	15.24±0.14	4	68	19.50±0.08	3.15±0.01	0.39	2
83450	(83450) 2001 SP60	3.06	0.13	1.59	158.5	151.9	4.8	3.43	2.46	3.13	14.97±0.22	3	58	19.88±0.11	5.05±0.08	0.83	2
83701	(83701) 2001 TA75	3.10	0.17	2.65	91.6	217.3	6.1	3.59	2.63	3.19	14.57±0.15	4	58	19.82±0.09	2.94±0.08	0.21	2
83711	(83711) 2001 TH82	3.09	0.18	5.94	287.7	63.4	8.8	3.33	2.37	3.99	14.03±0.13	4	86	18.93±0.05	3.57±0.03	0.25	2
83831	(83831) 2001 UE23	3.10	0.05	8.26	289.6	89.4	5.0	3.10	2.13	2.51	14.12±0.14	4	75	18.38±0.04	4.44±0.02	0.31	3

Table 2—Continued

Obj ID	Designation	a	e	i	Ω	ω	D	Δ	r	α	H_R	n	m	PTF_R	Period (hr)	Δm	U
83875	(83875) 2001 UA95	3.04	0.04	1.59	353.5	323.5	5.6	3.15	2.16	0.53	15.02±0.09	4	74	19.31±0.07	4.17±0.04	0.29	2
83917	(83917) 2001 VB11	3.15	0.02	9.83	283.8	30.3	7.4	3.22	2.24	2.74	14.41±0.17	4	75	18.98±0.05	4.40±0.04	0.45	3
84042 ^b	(84042) 2002 PQ56	2.27	0.12	6.46	299.4	91.0	1.5	2.21	1.24	6.06	16.09±0.23	4	76	18.75±0.04	8.07±0.07	0.76	3
84394	(84394) 2002 TD174	2.26	0.13	7.15	103.0	208.5	1.5	2.53	1.58	7.40	16.14±0.21	4	64	19.65±0.09	6.71±0.10	0.65	3
84407	(84407) 2002 TU181	3.01	0.20	1.27	165.9	249.3	4.8	2.64	1.68	5.78	14.52±0.18	3	52	18.20±0.03	11.85±0.14	0.43	2
84825	(84825) 2002 YE26	2.34	0.22	1.80	103.7	229.2	1.7	2.76	1.84	8.44	15.90±0.14	4	63	19.99±0.12	4.02±0.03	0.44	2
85400	(85400) 1996 TD10	2.57	0.21	0.77	14.6	1.5	2.9	2.53	1.56	4.59	15.70±0.13	4	78	19.06±0.06	8.07±0.20	0.27	2
85401	(85401) Yamatenclub	2.53	0.13	3.50	2.3	40.0	3.0	2.62	1.63	1.44	14.92±0.20	4	85	18.25±0.03	17.78±0.32	0.57	3
85424	(85424) 1997 AA3	3.13	0.25	15.37	321.5	68.7	11.3	3.34	2.36	1.80	13.49±0.18	4	88	18.19±0.03	7.16±0.05	0.46	3
85834	(85834) 1998 XM74	2.41	0.14	3.15	94.9	72.6	3.0	2.17	1.20	5.06	14.71±0.16	3	53	17.19±0.01	2.86±0.01	0.17	2
85836	(85836) 1998 YF2	2.42	0.14	2.31	107.0	8.7	2.4	2.08	1.10	4.62	14.94±0.04	2	55	17.10±0.01	5.36±0.12	0.11	2
86275	(86275) 1999 TA320	3.36	0.06	6.80	311.7	58.4	8.1	3.50	2.52	2.73	14.21±0.15	4	75	19.21±0.06	7.44±0.06	0.40	3
86649	(86649) 2000 EM152	2.34	0.09	2.69	287.4	228.9	1.8	2.19	1.21	3.11	15.76±0.10	4	79	18.13±0.03	3.31±0.03	0.14	2
86759	(86759) 2000 GX72	2.36	0.19	2.10	191.0	96.5	1.7	2.66	1.67	2.35	15.80±0.30	4	73	19.34±0.06	5.55±0.03	0.88	3
86824	(86824) 2000 GS140	2.36	0.17	2.07	90.2	138.7	1.2	2.41	1.48	9.93	16.54±0.15	4	60	19.89±0.10	2.87±0.04	0.42	2
86882	(86882) 2000 HE27	2.37	0.15	5.43	105.2	122.3	1.6	2.43	1.48	8.22	15.94±0.15	4	75	19.29±0.06	3.82±0.05	0.31	2
87208	(87208) 2000 OQ32	2.53	0.28	4.25	269.4	68.4	2.6	2.92	1.94	3.27	15.91±0.27	4	65	19.88±0.09	4.90±0.02	0.87	3
87234	(87234) 2000 OX43	2.54	0.19	12.76	308.6	73.3	3.2	2.54	1.61	9.07	14.53±0.17	3	40	18.26±0.03	3.56±0.01	0.25	3
87405	(87405) 2000 QP77	2.55	0.16	1.48	279.3	88.9	3.1	2.57	1.60	2.48	15.57±0.19	4	73	18.89±0.05	8.89±0.08	0.66	3
87421	(87421) 2000 QS97	2.56	0.24	3.28	116.9	240.7	2.9	2.67	1.69	2.44	15.67±0.18	4	69	19.15±0.07	6.76±0.10	0.49	2
87560	(87560) 2000 RE4	2.55	0.19	3.57	156.4	241.9	3.1	2.65	1.67	1.04	15.57±0.14	4	77	18.87±0.05	2.61±0.01	0.23	2
87567	(87567) 2000 RC11	2.58	0.26	3.38	136.3	248.3	3.6	2.91	1.92	1.92	15.25±0.12	4	72	19.20±0.06	3.28±0.02	0.25	3
87855	(87855) 2000 SB220	2.59	0.16	7.14	112.6	312.3	2.7	2.31	1.37	9.56	15.25±0.24	4	75	18.43±0.03	12.47±0.16	0.74	3
87971	(87971) 2000 TW38	3.11	0.04	16.46	146.8	119.2	6.6	3.15	2.17	1.52	14.49±0.14	3	56	18.71±0.05	7.01±0.10	0.30	2
87984	(87984) 2000 TP57	2.54	0.26	8.04	113.9	219.4	2.8	2.97	2.01	4.30	15.81±0.15	4	68	20.00±0.12	10.43±0.22	0.39	2
88208	(88208) 2000 YG120	2.57	0.19	13.76	117.1	259.8	4.6	2.59	1.64	7.27	14.71±0.17	4	73	18.53±0.04	4.53±0.02	0.46	3
88531	(88531) 2001 QO180	2.37	0.11	7.22	102.2	193.6	1.4	2.64	1.68	6.08	16.26±0.12	3	60	19.93±0.11	2.90±0.03	0.44	2
88569	(88569) 2001 QT245	2.34	0.17	6.86	162.3	125.7	1.3	2.60	1.62	3.25	16.52±0.21	4	56	19.95±0.10	5.05±0.05	0.70	3
88704	(88704) 2001 SF	2.38	0.22	3.34	96.4	228.3	1.6	2.84	1.91	7.24	16.02±0.18	4	73	20.17±0.12	6.27±0.08	0.68	2
88742	(88742) 2001 SU48	2.35	0.14	8.09	151.0	134.7	1.6	2.59	1.61	4.33	15.97±0.25	2	32	19.40±0.08	7.44±0.12	0.66	3
89284	(89284) 2001 VY17	2.39	0.07	1.07	122.0	185.3	1.2	2.55	1.56	1.10	16.61±0.17	4	67	19.89±0.10	5.13±0.03	0.59	3
89375	(89375) 2001 VB91	3.07	0.08	10.02	151.6	235.9	7.0	3.22	2.23	1.89	14.53±0.14	4	77	18.93±0.05	4.27±0.06	0.21	2

Table 2—Continued

Obj ID	Designation	a	e	i	Ω	ω	D	Δ	r	α	H_R	n	m	PTF_R	Period (hr)	Δm	U
89413	(89413) 2001 WM21	2.43	0.06	7.37	125.4	74.1	2.0	2.42	1.44	3.35	15.56±0.16	4	76	18.60±0.04	7.87±0.07	0.37	3
89655	(89655) 2001 XA251	3.17	0.11	4.02	90.7	229.3	5.6	3.50	2.60	7.53	15.03±0.26	3	40	20.28±0.13	9.32±0.18	0.79	2
89885	(89885) 2002 CP228	3.42	0.10	8.75	290.6	310.1	6.6	3.58	2.63	4.19	14.91±0.16	4	65	19.90±0.10	14.12±0.40	0.54	2
90242	(90242) 2003 BF52	3.08	0.06	10.17	147.2	69.0	5.8	2.98	1.99	1.32	14.81±0.22	4	89	18.86±0.04	5.49±0.03	0.67	3
90275	(90275) 2003 DM	3.10	0.10	5.80	147.0	99.3	6.3	3.08	2.09	0.62	14.88±0.13	4	79	19.02±0.06	4.55±0.04	0.38	3
90282	(90282) 2003 DS20	3.26	0.14	2.73	115.2	172.0	5.9	3.72	2.76	3.86	14.60±0.12	4	67	19.99±0.11	2.82±0.03	0.36	2
91081 ^b	(91081) 1998 FR109	2.55	0.14	6.65	323.0	154.1	3.0	2.24	1.26	2.77	15.59±0.17	4	82	18.15±0.03	5.42±0.03	0.56	3
91245	(91245) 1999 CN34	2.41	0.11	1.48	65.0	104.9	4.6	2.16	1.17	1.48	15.62±0.05	2	46	17.80±0.02	3.95±0.10	0.08	2
91493	(91493) 1999 RE134	2.63	0.10	13.52	316.6	113.1	4.1	2.53	1.56	5.37	14.49±0.09	4	80	17.84±0.02	16.00±0.26	0.23	3
92528	(92528) 2000 OQ8	2.45	0.14	14.23	312.2	344.0	2.0	2.79	1.87	8.96	15.50±0.14	3	54	19.65±0.08	4.59±0.04	0.40	2
92941	(92941) 2000 RP34	2.55	0.12	6.93	305.5	163.4	5.3	2.26	1.32	9.77	15.07±0.09	4	75	18.08±0.02	10.79±0.24	0.13	2
92963	(92963) 2000 RN48	2.59	0.12	9.97	309.3	115.9	5.4	2.40	1.48	10.57	14.34±0.17	4	78	17.79±0.02	11.57±0.14	0.45	3
93069	(93069) 2000 SX24	2.57	0.16	5.32	320.6	83.3	2.9	2.43	1.52	10.76	15.69±0.15	3	60	19.19±0.07	9.23±0.09	0.47	3
93090	(93090) 2000 SF37	2.53	0.11	6.51	161.9	229.0	2.4	2.62	1.64	4.32	16.11±0.24	4	72	19.61±0.08	6.76±0.05	0.86	3
93150	(93150) 2000 SC81	2.54	0.03	3.38	128.4	346.8	2.5	2.47	1.51	6.76	14.78±0.39	2	21	18.32±0.04	5.39±0.06	0.73	2
93152	(93152) 2000 ST83	2.55	0.14	1.23	95.4	48.1	2.8	2.24	1.26	4.54	15.14±0.25	4	55	17.82±0.02	6.11±0.04	0.86	3
93335*	(93335) 2000 SK235	2.55	0.11	1.69	115.1	307.1	1.9	2.36	1.40	7.22	16.57±0.21	4	58	19.60±0.09	6.27±0.08	0.59	2
93348	(93348) 2000 SP250	2.55	0.19	4.68	116.3	224.8	3.6	2.80	1.83	2.96	16.21±0.23	4	57	20.02±0.10	7.87±0.06	0.77	3
93412	(93412) 2000 ST300	2.59	0.18	3.24	306.3	114.7	2.5	2.24	1.26	3.98	16.06±0.20	4	78	18.67±0.04	9.06±0.09	0.66	3
93452	(93452) 2000 SY351	2.55	0.10	14.85	112.1	18.4	2.8	2.29	1.33	7.79	14.76±0.12	3	62	17.66±0.02	8.42±0.07	0.39	3
93540	(93540) 2000 UG19	2.59	0.14	13.88	146.3	312.2	3.5	2.34	1.35	1.21	15.29±0.11	4	63	17.96±0.03	3.52±0.03	0.20	2
93578	(93578) 2000 UW47	2.59	0.09	0.72	346.3	76.0	2.7	2.45	1.51	8.89	15.82±0.14	4	76	19.03±0.06	6.81±0.05	0.30	3
93660	(93660) 2000 UH104	2.52	0.18	3.41	309.6	7.3	3.8	2.95	1.96	0.92	14.04±0.10	4	86	17.97±0.03	2.34±0.00	0.11	2
93693	(93693) 2000 VC23	2.52	0.11	1.84	248.9	23.3	4.5	2.67	1.70	5.01	13.85±0.15	4	78	17.54±0.02	4.23±0.02	0.42	3
93707*	(93707) 2000 VP31	2.58	0.17	2.41	212.5	179.9	3.2	2.68	1.71	4.34	15.50±0.20	4	68	19.15±0.06	11.16±0.13	0.71	3
93710	(93710) 2000 VR33	2.62	0.16	2.59	121.9	301.9	3.4	2.32	1.36	6.84	15.32±0.13	3	64	18.28±0.03	6.08±0.04	0.33	3
94905	(94905) 2001 YS24	2.41	0.14	0.80	298.2	310.8	1.4	2.43	1.45	3.78	16.23±0.07	2	42	19.26±0.05	2.72±0.06	0.10	2
95201	(95201) 2002 BJ19	2.56	0.08	10.54	117.3	10.0	3.0	2.36	1.39	4.03	15.22±0.13	4	75	18.14±0.02	21.33±1.52	0.18	2
95218	(95218) 2002 CO14	2.52	0.09	2.77	323.8	245.1	1.9	2.37	1.39	0.63	15.58±0.21	4	80	18.33±0.03	5.42±0.03	0.61	3
95746	(95746) 2003 EW22	2.40	0.17	2.95	130.3	110.4	1.5	2.32	1.33	1.04	16.15±0.09	4	78	18.70±0.04	3.79±0.07	0.11	2
95971	(95971) 2004 LU8	2.43	0.19	3.59	127.8	205.2	1.9	2.90	1.91	0.95	15.58±0.33	3	53	19.42±0.06	6.44±0.04	0.96	3
96008	(96008) 2004 OA5	3.21	0.22	7.23	320.7	309.5	3.0	3.45	2.46	1.77	14.80±0.14	4	87	19.64±0.08	4.19±0.04	0.47	3

Table 2—Continued

Obj ID	Designation	a	e	i	Ω	ω	D	Δ	r	α	H_R	n	m	PTF_R	Period (hr)	Δm	U
96014	(96014) 2004 PD7	2.45	0.19	3.15	152.6	189.7	1.4	2.90	1.91	0.75	16.31±0.16	4	54	20.14±0.12	3.56±0.03	0.55	2
96069	(96069) 6060 P-L	2.53	0.15	3.80	342.6	45.5	2.6	2.48	1.54	8.50	15.20±0.07	2	52	18.65±0.03	2.20±0.02	0.20	2
96796	(96796) 1999 RQ124	2.66	0.17	12.24	318.5	41.6	3.2	2.87	1.97	9.69	15.50±0.33	4	61	19.80±0.08	5.96±0.04	0.92	3
96848	(96848) 1999 RL221	2.58	0.24	10.28	147.5	184.6	4.4	3.21	2.22	0.80	14.78±0.11	2	48	19.17±0.06	6.36±0.20	0.23	2
96974	(96974) 1999 TL194	2.73	0.15	7.56	286.2	131.0	5.5	2.45	1.48	4.42	15.25±0.11	4	71	18.41±0.04	3.47±0.03	0.27	2
97029	(97029) 1999 TT323	2.69	0.16	12.03	295.4	48.1	4.0	2.94	1.99	5.32	14.97±0.14	4	68	19.22±0.07	3.32±0.02	0.32	2
97050	(97050) 1999 UD45	2.68	0.20	10.71	299.1	52.8	5.7	2.93	1.98	6.22	15.09±0.15	4	75	19.49±0.07	6.11±0.11	0.51	2
97512	(97512) 2000 CV118	2.86	0.08	1.15	318.2	53.4	3.8	2.89	1.92	3.84	15.84±0.18	4	66	19.82±0.10	9.06±0.08	0.55	2
98442	(98442) 2000 UT55	2.59	0.17	4.59	151.7	344.0	2.5	2.15	1.17	5.25	15.06±0.10	2	27	17.47±0.01	2.87±0.03	0.17	2
98505	(98505) 2000 VC16	2.57	0.11	6.14	98.5	70.1	4.5	2.37	1.47	12.06	14.73±0.06	1	26	18.12±0.02	3.05±0.11	0.20	2
98746	(98746) 2000 YQ49	2.61	0.17	3.14	273.3	108.7	2.8	2.81	1.83	3.48	15.74±0.14	4	70	19.57±0.08	10.11±0.21	0.42	3
98786	(98786) 2000 YR96	2.66	0.12	6.74	114.0	6.6	3.3	2.36	1.38	4.13	15.44±0.20	4	81	18.42±0.03	17.45±0.31	0.63	3
99013	(99013) 2001 DX64	2.66	0.30	7.13	314.9	347.1	3.2	3.30	2.31	1.80	14.51±0.14	4	82	19.12±0.05	3.54±0.01	0.38	3
99014	(99014) 2001 DG65	2.66	0.05	11.23	333.0	70.4	3.2	2.70	1.71	1.88	15.05±0.11	4	80	18.58±0.04	14.55±0.45	0.22	2
99163	(99163) 2001 FO140	2.72	0.12	6.07	107.4	354.6	3.4	2.40	1.46	9.17	15.34±0.30	4	78	18.68±0.04	13.15±0.18	0.94	3
99172	(99172) 2001 FG160	2.70	0.03	5.46	328.4	63.9	3.8	2.74	1.75	1.52	15.14±0.11	4	83	18.74±0.04	7.06±0.10	0.25	2
99175	(99175) 2001 FY163	2.72	0.10	1.85	138.8	249.0	3.2	2.84	1.85	1.75	15.51±0.12	4	84	19.15±0.06	3.36±0.02	0.28	3
99189	(99189) 2001 FV190	2.71	0.06	8.46	114.8	340.4	4.5	2.56	1.62	8.08	15.61±0.22	4	71	19.21±0.06	11.16±0.13	0.89	3
99264	(99264) 2001 OP42	2.36	0.17	4.05	293.1	335.5	1.6	2.71	1.74	3.51	15.99±0.13	4	68	19.67±0.09	2.95±0.04	0.34	2
99302	(99302) 2001 RU92	3.07	0.13	2.45	265.1	146.6	5.5	3.05	2.07	3.30	15.04±0.10	4	70	19.38±0.06	5.65±0.07	0.21	2
99760 ^b	(99760) 2002 JN100	2.62	0.10	15.53	118.4	15.6	5.6	2.35	1.40	7.27	14.71±0.28	4	81	17.78±0.02	7.50±0.06	0.85	3
A0390	(100390) 1995 WK13	2.29	0.14	6.08	101.4	161.3	1.6	2.50	1.59	11.12	16.03±0.32	3	43	19.77±0.08	8.42±0.15	0.82	2
A0685	(100685) 1997 YH2	2.17	0.12	5.34	99.8	29.7	1.2	1.92	0.96	8.46	16.57±0.06	2	50	18.42±0.04	2.50±0.03	0.18	2
A1174	(101174) 1998 SZ4	2.35	0.18	3.28	125.8	245.9	1.8	2.37	1.41	5.43	16.13±0.35	3	61	19.18±0.06	9.06±0.08	1.00	3
A1383	(101383) 1998 UK23	2.35	0.12	13.39	303.4	50.3	2.0	2.48	1.53	7.84	15.48±0.09	1	28	18.90±0.05	2.57±0.11	0.35	2
A1978	(101978) 1999 RZ52	2.21	0.14	4.43	335.0	13.5	1.4	2.39	1.45	8.83	16.25±0.15	4	65	19.53±0.06	5.42±0.06	0.30	2
A2032	(102032) 1999 RC106	2.20	0.19	5.02	281.6	2.2	2.3	2.61	1.64	4.20	15.52±0.23	4	70	19.03±0.06	5.65±0.03	0.74	3
A2333	(102333) 1999 TK112	2.22	0.15	1.59	314.4	2.4	1.1	2.53	1.57	6.60	16.85±0.27	3	52	20.31±0.13	7.16±0.05	1.04	3
A2358	(102358) 1999 TN134	2.58	0.15	4.01	0.4	267.7	2.4	2.68	1.69	1.53	15.37±0.19	4	86	18.86±0.05	18.11±0.34	0.58	3
A3375 ^b	(103375) 2000 AT114	2.31	0.05	6.08	121.9	22.9	1.2	2.20	1.22	5.35	16.68±0.26	4	75	19.21±0.06	7.33±0.06	0.79	3
A3424	(103424) 2000 AY155	2.29	0.12	2.38	301.2	152.7	1.6	2.04	1.10	10.66	16.07±0.09	4	78	18.47±0.03	4.51±0.04	0.12	2
A3708	(103708) 2000 CD84	2.80	0.20	2.34	324.5	267.6	3.3	2.60	1.61	0.78	15.39±0.11	4	78	18.45±0.04	5.36±0.06	0.21	2

Table 2—Continued

Obj ID	Designation	a	e	i	Ω	ω	D	Δ	r	α	H_R	n	m	PTF_R	Period (hr)	Δm	U
A3938	(103938) 2000 DU68	2.32	0.15	5.09	340.1	287.5	2.5	2.43	1.45	1.91	15.10±0.09	3	65	18.03±0.02	5.96±0.11	0.19	2
A4016	(104016) 2000 DH108	2.78	0.13	13.81	154.7	124.2	2.8	2.95	1.96	0.96	14.69±0.13	4	83	18.74±0.05	8.89±0.08	0.29	2
A4189	(104189) 2000 EQ100	2.35	0.21	1.28	306.9	100.0	1.3	2.11	1.16	9.59	16.54±0.10	4	72	19.07±0.06	3.89±0.05	0.19	2
A4245	(104245) 2000 ED135	2.84	0.07	6.25	141.0	119.9	2.8	2.90	1.91	1.54	15.13±0.10	4	68	19.05±0.06	3.07±0.02	0.33	2
A5547	(105547) 2000 RX44	3.09	0.23	10.15	342.6	334.3	6.8	3.76	2.77	0.85	14.60±0.12	4	62	19.81±0.10	3.01±0.02	0.41	2
A5775	(105775) 2000 SY112	2.53	0.19	1.60	155.6	217.6	2.2	2.83	1.84	1.49	16.30±0.18	4	69	20.04±0.12	3.69±0.03	0.60	2
A6328	(106328) 2000 UV102	3.20	0.12	4.09	294.6	12.6	6.2	3.55	2.58	3.17	14.78±0.11	4	78	19.92±0.10	10.21±0.34	0.38	2
A8004 ^b	(108004) 2001 FS138	2.73	0.03	6.75	111.0	30.1	5.0	2.65	1.72	8.96	15.35±0.28	4	70	19.29±0.06	8.65±0.08	0.78	3
A8177	(108177) 2001 HW12	2.28	0.13	1.81	171.2	91.6	1.3	2.52	1.55	3.19	16.43±0.16	2	51	19.67±0.09	10.32±0.23	0.58	3
A8204	(108204) 2001 HX22	2.26	0.13	8.04	155.8	111.3	1.7	2.38	1.39	4.03	15.86±0.09	4	81	18.79±0.04	2.49±0.02	0.16	2
A8304	(108304) 2001 JP	2.81	0.11	10.37	107.9	156.6	2.7	3.06	2.12	5.77	15.02±0.17	4	72	19.27±0.06	7.50±0.18	0.29	2
A8497 ^b	(108497) 2001 KJ64	2.32	0.21	4.37	106.9	265.9	2.0	2.41	1.50	11.44	16.31±0.37	4	49	19.76±0.09	5.42±0.03	1.24	3
A8543	(108543) 2001 LL9	2.25	0.13	6.50	150.8	78.6	2.1	2.17	1.18	2.07	16.04±0.12	2	36	18.32±0.04	2.67±0.04	0.10	2
A8797	(108797) 2001 OV69	2.42	0.20	1.60	99.7	253.6	1.5	2.56	1.58	2.28	16.17±0.20	4	67	19.43±0.08	5.45±0.03	0.54	3
A8818	(108818) 2001 OM77	2.34	0.19	11.11	347.1	21.6	2.8	2.69	1.71	2.71	15.88±0.23	4	57	19.41±0.07	7.11±0.05	0.49	2
A8912	(108912) 2001 PD12	3.06	0.08	11.06	114.4	294.5	4.7	2.96	2.01	6.19	14.20±0.13	4	69	18.38±0.03	10.21±0.11	0.26	3
A8931	(108931) 2001 PR22	2.42	0.20	5.40	290.9	91.9	1.4	2.31	1.34	3.73	16.33±0.23	4	73	19.11±0.06	14.77±0.23	0.73	3
A9510	(109510) 2001 QM235	2.39	0.19	0.44	278.3	116.2	1.4	2.53	1.54	0.66	16.34±0.24	3	53	19.49±0.08	5.27±0.03	0.64	3
A9653	(109653) 2001 RS7	2.37	0.04	6.48	292.9	155.2	3.4	2.29	1.33	7.00	16.37±0.23	4	71	19.29±0.07	6.49±0.04	0.67	3
A9663	(109663) 2001 RO18	3.05	0.24	0.85	332.2	24.0	6.0	3.34	2.41	6.32	15.43±0.10	4	57	20.47±0.13	3.84±0.19	0.36	2
B1744	(111744) 2002 CY99	2.56	0.07	1.85	86.1	130.9	2.2	2.57	1.64	8.64	16.25±0.19	2	49	19.95±0.09	5.82±0.07	0.73	3
B2191	(112191) 2002 JU105	2.61	0.21	1.26	80.4	106.4	3.1	2.28	1.36	10.82	15.49±0.15	4	76	18.61±0.04	2.59±0.01	0.33	3
B2858	(112858) 2002 QY29	2.77	0.08	4.74	0.2	13.4	4.4	2.94	1.96	2.66	15.63±0.17	2	27	19.67±0.11	4.07±0.07	0.34	2
B3006	(113006) 2002 RG39	2.74	0.11	7.65	315.5	315.9	2.8	2.88	1.90	3.08	15.38±0.26	4	83	19.16±0.06	5.49±0.03	0.85	3
B3008	(113008) 2002 RQ39	2.78	0.20	3.43	110.9	188.0	3.8	3.32	2.41	7.31	15.54±0.21	4	38	20.52±0.15	5.75±0.07	0.71	2
B3049	(113049) 2002 RM52	2.92	0.09	2.93	123.7	241.3	5.8	2.97	1.99	2.18	14.95±0.17	4	71	19.15±0.07	6.44±0.04	0.60	2
B3132	(113132) 2002 RM86	2.24	0.05	2.94	353.4	12.0	1.4	2.33	1.34	0.96	16.21±0.22	4	74	18.85±0.04	6.32±0.04	0.68	2
B3515	(113515) 2002 TT13	2.94	0.09	3.28	87.3	8.6	5.6	2.69	1.74	6.55	15.03±0.23	4	75	19.05±0.05	4.57±0.02	0.69	3
B3724	(113724) 2002 TL138	2.85	0.14	10.71	339.5	352.7	9.8	3.26	2.27	0.74	14.21±0.10	4	78	18.67±0.04	12.15±0.16	0.26	2
B3789	(113789) 2002 TZ194	2.93	0.09	1.81	13.5	31.3	3.8	2.86	1.94	8.89	15.89±0.25	4	53	19.95±0.10	4.87±0.05	0.93	3
B3946	(113946) 2002 TE298	2.77	0.13	3.98	329.4	308.0	2.6	2.98	1.99	2.64	15.44±0.20	4	64	19.57±0.08	9.14±0.09	0.63	3
B4034	(114034) 2002 VO8	2.29	0.09	6.22	280.5	29.2	1.3	2.50	1.52	3.20	16.37±0.18	4	65	19.53±0.09	3.17±0.02	0.53	3

Table 2—Continued

Obj ID	Designation	a	e	i	Ω	ω	D	Δ	r	α	H_R	n	m	PTF_R	Period (hr)	Δm	U
B4074	(114074) 2002 VF33	3.05	0.20	2.69	94.6	309.7	5.2	2.72	1.74	3.39	15.20±0.09	3	59	18.87±0.05	3.93±0.05	0.23	3
B4132	(114132) 2002 VH54	2.90	0.01	2.10	30.0	32.5	5.2	2.90	1.92	1.16	15.17±0.11	4	75	19.06±0.06	2.70±0.02	0.33	2
B4398	(114398) 2002 YT13	2.37	0.22	1.56	261.3	131.8	1.4	2.17	1.20	4.63	16.45±0.22	4	91	18.86±0.05	6.11±0.04	0.69	3
B4419	(114419) 2002 YQ31	2.39	0.21	4.16	300.6	100.8	1.6	2.18	1.23	9.25	15.87±0.25	3	62	18.58±0.04	4.97±0.03	0.59	3
B4508	(114508) 2003 AS82	2.39	0.22	4.04	114.3	244.4	4.3	2.51	1.54	4.58	15.83±0.14	4	66	18.96±0.05	14.33±0.61	0.25	2
B4546	(114546) 2003 BY29	2.38	0.15	1.97	311.2	115.3	1.4	2.11	1.14	5.96	16.73±0.29	4	72	19.07±0.06	8.73±0.08	0.80	3
B4574	(114574) 2003 BL68	3.13	0.19	19.13	147.9	98.1	7.2	3.03	2.04	1.24	14.09±0.16	4	80	18.33±0.03	5.36±0.03	0.40	3
B4756	(114756) 2003 HC45	2.53	0.18	1.60	93.7	205.1	2.3	2.98	2.04	6.40	16.20±0.16	4	50	20.53±0.15	3.18±0.03	0.48	2
B4915	(114915) 2003 QU34	2.67	0.17	12.90	150.4	252.7	2.5	2.75	1.76	0.61	15.99±0.23	4	73	19.54±0.08	16.55±0.28	0.74	3
B4999	(114999) 2003 QR74	2.66	0.11	7.96	309.8	103.4	3.2	2.65	1.67	3.46	15.51±0.28	2	37	19.02±0.06	5.42±0.03	0.80	2
B5152	(115152) 2003 SA68	2.73	0.19	2.16	207.6	183.2	3.3	2.85	1.87	4.50	15.43±0.12	4	71	19.45±0.07	5.65±0.03	0.32	3
B5504	(115504) 2003 UH29	2.80	0.08	0.57	76.2	325.1	4.4	2.72	1.75	3.97	16.18±0.16	4	63	19.91±0.10	10.11±0.31	0.59	2
B5887	(115887) 2003 VT1	2.75	0.07	7.75	307.9	198.5	2.7	2.55	1.57	3.62	15.89±0.33	4	75	19.29±0.06	12.31±0.16	1.07	2
B6232	(116232) 2003 YW5	2.75	0.03	6.52	138.9	191.8	3.0	2.83	1.84	1.26	15.66±0.14	4	72	19.39±0.07	2.88±0.03	0.29	2
B6503	(116503) 2004 BN23	2.89	0.05	3.11	123.8	303.5	4.0	2.87	1.89	1.13	15.76±0.20	4	75	19.54±0.08	11.85±0.14	0.67	2
B6588	(116588) 2004 BJ98	2.26	0.15	6.95	157.2	153.8	1.4	2.57	1.58	1.26	16.30±0.23	4	67	19.54±0.07	5.61±0.03	0.70	3
B6652	(116652) 2004 CX24	2.28	0.18	5.40	297.6	329.3	1.6	2.60	1.65	6.46	16.04±0.24	4	64	19.96±0.13	3.66±0.04	0.75	2
B6653	(116653) 2004 CJ29	2.86	0.08	0.99	294.2	53.6	4.3	3.07	2.08	0.58	15.61±0.20	4	75	19.85±0.09	8.81±0.08	0.55	3
B6944	(116944) 2004 GK44	2.27	0.13	1.00	198.9	101.0	1.0	2.50	1.51	0.75	17.09±0.14	4	67	19.97±0.09	2.75±0.02	0.32	2
B7352	(117352) 2004 XQ69	2.66	0.20	2.54	295.2	67.7	2.8	2.75	1.77	3.60	15.77±0.25	4	63	19.50±0.07	6.53±0.04	0.86	3
B7545	(117545) 2005 EN5	2.78	0.14	7.88	144.2	135.7	3.1	2.97	1.98	0.93	15.56±0.19	4	74	19.56±0.08	5.08±0.03	0.60	3
B8219	(118219) 1996 HT20	2.41	0.09	1.19	135.2	357.2	4.4	2.21	1.24	4.11	15.88±0.12	4	75	18.34±0.03	4.82±0.02	0.16	3
B8555	(118555) 2000 FH4	2.37	0.15	1.29	311.4	293.0	1.2	2.58	1.61	3.31	16.71±0.25	4	72	20.07±0.11	6.96±0.05	0.76	3
B8594	(118594) 2000 GZ89	2.37	0.07	7.59	109.7	130.9	1.5	2.45	1.50	7.50	16.09±0.26	4	92	19.46±0.08	5.33±0.03	0.87	3
B8756	(118756) 2000 QK200	3.03	0.14	14.67	156.1	111.9	5.1	3.17	2.18	1.20	15.24±0.16	4	64	19.68±0.09	11.16±0.13	0.38	2
B8873	(118873) 2000 TY14	2.56	0.08	1.11	21.7	69.4	2.5	2.38	1.42	7.57	16.03±0.16	4	75	19.18±0.06	3.12±0.01	0.39	3
B9173	(119173) 2001 QL49	2.41	0.17	2.86	122.0	271.5	1.6	2.28	1.31	5.61	16.01±0.12	4	73	18.82±0.04	11.29±0.27	0.29	3
B9184	(119184) 2001 QK87	2.43	0.17	11.64	287.1	135.5	3.8	2.14	1.17	5.26	15.61±0.10	4	81	17.98±0.02	3.42±0.02	0.21	3
B9403	(119403) 2001 TU62	2.43	0.14	2.34	168.3	289.1	1.5	2.20	1.21	3.32	16.14±0.11	4	78	18.60±0.04	8.65±0.16	0.30	3
C0071	(120071) 2003 DM16	3.08	0.03	9.98	153.2	7.0	5.1	3.00	2.01	1.37	15.21±0.16	4	82	19.32±0.07	9.70±0.10	0.45	3
C0556	(120556) 1995 CG10	2.42	0.21	2.83	167.5	185.6	1.4	2.87	1.88	1.19	16.29±0.31	4	46	20.15±0.10	5.85±0.04	1.03	3
C0559	(120559) 1995 EB2	2.43	0.15	2.02	183.0	247.9	1.3	2.29	1.31	5.96	16.39±0.11	4	64	19.15±0.06	2.77±0.02	0.25	2

Table 2—Continued

Obj ID	Designation	a	e	i	Ω	ω	D	Δ	r	α	H_R	n	m	PTF_R	Period (hr)	Δm	U
C0785	(120785) 1998 FT3	2.54	0.17	1.97	15.5	72.6	2.1	2.15	1.24	13.06	16.35±0.19	4	70	19.24±0.06	4.62±0.02	0.50	3
C0815	(120815) 1998 HB42	2.59	0.19	5.56	157.1	164.7	2.3	3.09	2.10	1.00	16.17±0.12	4	63	20.33±0.12	2.25±0.01	0.35	2
C0960	(120960) 1998 VC3	2.37	0.20	0.79	312.7	44.8	1.2	2.49	1.51	4.15	16.66±0.25	4	54	19.87±0.10	6.36±0.04	0.91	3
C1017 ^b	(121017) 1999 BG4	2.40	0.10	2.43	351.6	203.1	3.8	2.21	1.22	2.19	16.19±0.19	3	62	18.62±0.04	9.23±0.09	0.78	3
C2154	(122154) 2000 JS59	2.38	0.13	5.18	318.0	4.7	2.1	2.70	1.72	3.90	15.41±0.12	4	71	19.13±0.06	3.53±0.03	0.29	2
C2350	(122350) 2000 QB42	2.56	0.35	9.58	336.8	92.0	3.2	2.16	1.17	1.02	15.51±0.12	4	83	17.50±0.02	7.27±0.05	0.34	3
C2415	(122415) 2000 QF94	2.55	0.17	5.99	296.5	91.4	2.2	2.43	1.46	3.32	16.32±0.14	4	74	19.20±0.06	5.96±0.04	0.45	3
C2561	(122561) 2000 RP2	2.52	0.13	1.29	11.5	39.1	4.0	2.57	1.59	2.33	14.99±0.09	4	81	18.32±0.03	3.50±0.03	0.20	2
C2603	(122603) 2000 RM40	2.52	0.15	8.11	303.9	69.1	4.0	2.74	1.77	4.29	15.02±0.09	4	79	18.79±0.05	4.40±0.04	0.22	2
C2702	(122702) 2000 SV24	2.55	0.17	3.02	326.3	81.2	2.9	2.59	1.60	0.58	15.67±0.14	4	79	18.73±0.04	6.91±0.05	0.42	3
C2975	(122975) 2000 SE230	2.60	0.23	2.10	38.5	7.2	2.1	2.31	1.36	8.36	16.37±0.33	4	76	19.36±0.07	4.73±0.02	1.07	3
C3241	(123241) 2000 UL60	2.57	0.15	2.07	308.9	80.0	2.5	2.53	1.60	8.68	15.99±0.15	4	63	19.58±0.09	3.04±0.02	0.42	2
C4200	(124200) 2001 OM81	2.47	0.36	8.73	150.7	260.0	2.4	2.33	1.34	0.64	15.15±0.17	4	98	17.75±0.02	9.50±0.10	0.43	3
C4297	(124297) 2001 QE57	2.38	0.13	6.64	129.0	201.9	1.7	2.61	1.63	3.46	15.85±0.26	3	48	19.51±0.09	5.78±0.11	0.77	3
C4393	(124393) 2001 QM186	2.34	0.14	1.82	291.3	330.4	2.8	2.58	1.64	7.48	16.69±0.18	4	63	20.33±0.13	3.89±0.05	0.57	2
C4432	(124432) 2001 QJ247	2.38	0.21	2.21	89.9	268.8	1.4	2.82	1.84	1.77	16.22±0.22	4	68	19.97±0.11	15.48±0.48	0.69	3
C4497	(124497) 2001 RF45	2.43	0.14	7.43	156.5	257.2	3.9	2.42	1.43	2.88	15.19±0.11	4	81	18.14±0.03	7.33±0.06	0.21	3
C4525	(124525) 2001 RE81	2.39	0.20	2.37	298.0	63.7	3.2	2.75	1.77	3.00	16.15±0.12	4	69	19.86±0.10	4.07±0.03	0.36	2
C4575	(124575) 2001 SJ12	2.34	0.08	4.84	176.6	89.2	3.9	2.42	1.45	4.73	16.56±0.29	2	31	19.60±0.09	6.81±0.15	0.86	2
C4627	(124627) 2001 SF60	2.39	0.10	3.87	275.2	114.6	1.4	2.48	1.50	4.84	16.29±0.19	4	69	19.56±0.08	9.23±0.09	0.71	3
C4856	(124856) 2001 TS22	2.44	0.21	1.45	317.0	93.1	1.1	2.41	1.43	2.50	16.80±0.17	4	71	19.71±0.09	2.71±0.02	0.49	3
C4866 ^b	(124866) 2001 TM30	2.41	0.14	2.28	264.6	283.7	1.5	2.28	1.30	3.19	16.11±0.30	4	71	18.76±0.05	5.11±0.03	0.83	3
C4934	(124934) 2001 TA76	2.38	0.20	2.44	85.8	259.9	1.5	2.86	1.87	1.59	16.09±0.17	2	34	19.92±0.11	4.92±0.03	0.69	2
C5083	(125083) 2001 UM12	2.46	0.19	1.89	330.2	85.2	1.0	2.19	1.25	10.18	16.99±0.11	2	49	19.81±0.09	5.03±0.08	0.35	2
C5310 ^b	(125310) 2001 VN32	2.46	0.17	2.15	303.8	119.5	2.1	2.35	1.37	3.80	15.79±0.40	4	78	18.71±0.04	6.15±0.04	1.26	3
C5390	(125390) 2001 VZ84	2.38	0.10	6.18	320.8	325.2	1.6	2.53	1.55	1.54	16.05±0.18	4	71	19.26±0.07	9.14±0.09	0.53	3
C5539	(125539) 2001 WN90	3.15	0.13	4.49	314.4	183.5	7.4	2.75	1.77	3.79	14.48±0.10	4	78	18.30±0.03	8.07±0.21	0.21	2
C5579	(125579) 2001 XT24	2.49	0.10	6.42	317.2	124.0	2.2	2.36	1.38	3.76	15.70±0.09	4	77	18.52±0.04	2.92±0.02	0.17	2
C5793	(125793) 2001 XC153	2.43	0.20	2.05	144.9	208.6	1.5	2.85	1.86	1.48	16.20±0.20	4	53	19.99±0.12	5.11±0.05	0.63	2
C5828	(125828) 2001 XT174	2.51	0.10	1.38	171.7	244.9	2.2	2.34	1.37	3.51	16.27±0.22	4	74	19.00±0.06	5.85±0.07	0.54	3
C6236	(126236) 2002 AC59	2.53	0.16	8.17	296.0	172.3	1.9	2.12	1.15	4.54	15.94±0.25	4	68	18.27±0.03	9.80±0.10	0.72	3
C6334*	(126334) 2002 AW152	2.54	0.05	5.52	118.3	37.2	2.7	2.44	1.49	7.40	15.82±0.17	4	78	19.13±0.06	3.50±0.01	0.47	3

Table 2—Continued

Obj ID	Designation	a	e	i	Ω	ω	D	Δ	r	α	H_R	n	m	PTF_R	Period (hr)	Δm	U
C6406	(126406) 2002 BG16	2.53	0.15	13.74	159.3	105.4	2.5	2.67	1.69	4.48	15.36 \pm 0.23	4	70	18.92 \pm 0.05	4.51 \pm 0.02	0.68	3
C6491	(126491) 2002 CC56	2.54	0.11	5.18	322.9	226.1	2.8	2.31	1.33	2.91	15.76 \pm 0.12	4	75	18.41 \pm 0.03	2.57 \pm 0.02	0.17	2
C6788	(126788) 2002 EH19	2.58	0.11	13.36	296.9	264.9	3.2	2.53	1.56	4.36	15.50 \pm 0.14	3	52	18.77 \pm 0.04	2.62 \pm 0.05	0.13	2
C7693	(127693) 2003 EG20	2.44	0.15	0.55	251.0	347.6	1.1	2.60	1.63	4.19	16.72 \pm 0.26	4	28	20.28 \pm 0.14	5.39 \pm 0.06	1.00	2
C7955	(127955) 2003 HY13	2.56	0.25	5.21	122.9	193.6	2.5	3.16	2.21	5.78	16.04 \pm 0.21	4	42	20.70 \pm 0.16	2.31 \pm 0.02	0.73	2
C8046 ^b	(128046) 2003 MY1	2.60	0.08	14.43	294.9	307.0	3.0	2.71	1.74	5.29	15.13 \pm 0.30	4	76	18.90 \pm 0.05	8.35 \pm 0.07	0.89	3
C8891	(128891) 2004 SP59	2.57	0.18	9.03	145.9	238.5	3.0	2.80	1.82	0.80	15.62 \pm 0.22	4	76	19.23 \pm 0.06	9.90 \pm 0.10	0.65	3
C9000	(129000) 2004 TO247	2.55	0.17	14.81	150.6	223.4	3.0	2.80	1.82	2.85	15.65 \pm 0.17	4	86	19.49 \pm 0.08	3.61 \pm 0.03	0.49	3
C9079	(129079) 2004 VZ70	3.95	0.21	2.33	46.3	25.1	7.6	3.67	2.68	0.92	14.37 \pm 0.17	4	90	19.48 \pm 0.07	3.20 \pm 0.01	0.52	3
C9152	(129152) 2005 EQ133	2.79	0.10	9.96	113.2	344.8	2.6	2.52	1.57	6.93	15.94 \pm 0.15	4	52	19.45 \pm 0.07	3.39 \pm 0.04	0.30	2
C9236	(129236) 2005 PE19	2.21	0.16	0.60	264.6	11.7	1.2	2.39	1.40	2.80	16.69 \pm 0.10	4	76	19.58 \pm 0.08	3.58 \pm 0.04	0.21	2
C9334	(129334) 2005 UN68	2.32	0.14	7.50	133.7	211.3	1.0	2.65	1.66	2.22	16.99 \pm 0.16	3	37	20.37 \pm 0.14	5.16 \pm 0.08	0.49	2
D1128	(131128) 2001 BX31	2.65	0.30	0.41	99.9	2.9	2.1	2.03	1.04	0.70	16.61 \pm 0.10	4	84	18.08 \pm 0.02	2.85 \pm 0.02	0.15	2
D2351	(132351) 2002 GT52	2.57	0.14	4.12	183.5	338.1	1.9	2.22	1.24	4.48	16.60 \pm 0.24	4	71	19.08 \pm 0.05	5.65 \pm 0.03	0.81	3
D2394	(132394) 2002 GW96	2.59	0.17	3.43	296.8	343.2	2.2	2.84	1.87	3.54	16.29 \pm 0.15	4	64	20.12 \pm 0.12	7.38 \pm 0.11	0.47	2
D2561	(132561) 2002 JV93	2.62	0.13	1.75	276.8	349.3	2.6	2.72	1.74	1.82	15.94 \pm 0.20	4	74	19.47 \pm 0.07	5.52 \pm 0.03	0.60	3
D2676	(132676) 2002 NR14	2.67	0.19	3.43	107.1	185.8	3.7	2.98	1.99	1.33	15.85 \pm 0.18	1	24	19.88 \pm 0.08	7.11 \pm 0.57	0.60	2
D2699	(132699) 2002 NY43	2.76	0.08	3.10	231.0	160.1	3.1	2.84	1.87	4.33	15.56 \pm 0.15	4	72	19.54 \pm 0.09	6.11 \pm 0.04	0.56	3
D3372	(133372) 2003 SR145	2.64	0.20	11.55	309.9	279.0	6.0	2.69	1.76	8.28	14.77 \pm 0.17	4	99	18.72 \pm 0.04	18.82 \pm 0.36	0.53	2
D3489	(133489) 2003 SE268	2.73	0.04	2.08	300.3	340.7	2.8	2.84	1.89	5.51	15.79 \pm 0.15	4	53	19.82 \pm 0.08	3.90 \pm 0.06	0.35	2
D3701	(133701) 2003 UD230	2.68	0.06	3.31	132.1	184.1	2.7	2.83	1.84	1.73	15.85 \pm 0.15	3	54	19.63 \pm 0.08	2.74 \pm 0.02	0.37	2
D3752	(133752) 2003 WE23	2.80	0.09	3.16	99.3	270.5	3.2	2.86	1.91	6.63	15.46 \pm 0.22	3	66	19.61 \pm 0.09	5.55 \pm 0.03	0.64	3
D4121	(134121) 2004 YE30	2.60	0.13	4.64	171.4	76.3	2.0	2.61	1.62	2.18	16.40 \pm 0.18	4	59	19.79 \pm 0.10	9.32 \pm 0.26	0.75	2
D4407	(134407) 1998 BV9	2.93	0.11	3.39	142.1	264.6	4.4	3.00	2.02	1.81	15.55 \pm 0.17	4	71	19.42 \pm 0.08	8.28 \pm 0.07	0.54	3
D4752 ^b	(134752) 2000 BQ35	2.78	0.16	3.27	339.9	272.0	4.7	2.79	1.80	0.68	15.57 \pm 0.26	4	98	19.06 \pm 0.06	9.41 \pm 0.09	0.75	3
D4775	(134775) 2000 DT34	2.79	0.08	5.03	149.4	134.6	3.0	2.92	1.93	0.78	15.72 \pm 0.20	4	73	19.75 \pm 0.10	12.47 \pm 0.16	0.56	2
D4896	(134896) 2000 WH13	2.15	0.23	5.12	103.5	239.7	1.0	2.42	1.47	7.68	17.07 \pm 0.16	4	61	20.37 \pm 0.13	4.27 \pm 0.08	0.55	2
D5098	(135098) 2001 QE78	3.14	0.25	1.80	351.3	46.0	6.8	3.28	2.29	0.77	14.61 \pm 0.15	4	81	19.12 \pm 0.06	6.86 \pm 0.05	0.50	3
D5150	(135150) 2001 QC218	3.05	0.21	2.33	156.4	270.3	5.8	2.87	1.88	0.59	14.96 \pm 0.22	4	75	18.79 \pm 0.05	10.67 \pm 0.12	0.67	3
D5208	(135208) 2001 RF68	3.15	0.17	5.29	275.4	130.3	9.0	2.85	1.88	2.93	14.26 \pm 0.11	2	54	18.18 \pm 0.03	3.62 \pm 0.03	0.30	3
D5223	(135223) 2001 RK109	2.93	0.04	0.98	318.3	275.4	5.9	2.92	1.93	0.77	14.91 \pm 0.24	4	78	18.84 \pm 0.04	7.93 \pm 0.07	0.78	3
D5240	(135240) 2001 SJ10	3.09	0.18	3.05	110.5	277.0	4.7	3.06	2.15	7.92	15.40 \pm 0.31	3	31	20.13 \pm 0.11	6.53 \pm 0.04	0.92	2

Table 2—Continued

Obj ID	Designation	a	e	i	Ω	ω	D	Δ	r	α	H_R	n	m	PTF_R	Period (hr)	Δm	U
D5250	(135250) 2001 SY33	3.10	0.20	1.63	152.6	267.9	6.3	2.96	1.98	1.62	14.77±0.13	4	88	18.73±0.04	3.32±0.03	0.19	2
D5354	(135354) 2001 TA77	3.16	0.18	2.32	135.6	231.5	5.8	3.23	2.26	3.11	14.99±0.17	4	55	19.49±0.07	7.27±0.05	0.55	3
D5361	(135361) 2001 TW118	3.14	0.21	14.20	313.9	93.5	9.8	2.89	1.99	9.70	13.96±0.14	4	74	18.34±0.03	5.52±0.06	0.35	2
D5365	(135365) 2001 TS123	3.05	0.09	8.97	322.6	88.6	6.7	3.06	2.07	1.88	14.64±0.17	4	122	18.91±0.05	16.00±0.26	0.52	3
D5378	(135378) 2001 TG148	2.40	0.07	7.44	152.8	321.4	1.4	2.27	1.29	1.91	16.22±0.23	4	91	18.71±0.04	9.50±0.09	0.64	3
D5452	(135452) 2001 VF26	3.21	0.20	0.53	256.2	136.2	7.0	2.99	2.02	3.61	14.94±0.15	4	77	19.16±0.06	20.00±1.33	0.41	3
D6159	(136159) 2003 UE15	2.17	0.13	0.91	346.1	51.0	0.9	2.08	1.12	8.12	17.27±0.32	4	68	19.71±0.08	6.23±0.04	1.00	3
D6624	(136624) 1994 PD14	3.23	0.15	3.72	295.7	73.9	5.9	3.33	2.39	5.33	14.80±0.22	4	72	19.64±0.09	11.71±0.14	0.49	2
D6865	(136865) 1998 FE41	2.19	0.04	3.19	171.9	299.9	1.4	2.12	1.14	2.84	16.27±0.19	4	72	18.35±0.03	4.34±0.02	0.66	3
D8579	(138579) 2000 QA132	3.09	0.19	16.64	321.7	23.3	7.1	3.63	2.66	3.17	14.52±0.19	4	82	19.77±0.08	8.97±0.16	0.60	3
D8699	(138699) 2000 SL77	3.32	0.25	1.96	303.9	130.5	5.2	2.62	1.65	4.99	15.16±0.12	4	77	18.73±0.04	5.05±0.05	0.23	2
D9016	(139016) 2001 DU58	2.21	0.18	4.78	318.3	57.2	1.7	2.27	1.36	12.13	15.92±0.21	4	64	19.06±0.05	5.85±0.04	0.68	3
D9191	(139191) 2001 FG152	2.23	0.09	5.30	105.5	19.9	1.4	2.04	1.06	4.45	16.32±0.12	3	65	18.31±0.03	9.06±0.09	0.34	3
D9842	(139842) 2001 RV43	2.96	0.12	9.90	341.8	359.9	3.5	3.32	2.33	0.73	14.98±0.13	4	70	19.49±0.07	2.82±0.02	0.33	2
D9878	(139878) 2001 RT84	2.99	0.07	10.05	337.9	95.3	5.3	2.94	1.95	0.62	15.14±0.24	4	79	19.07±0.05	16.27±0.28	0.75	3
E0190	(140190) 2001 SJ214	3.00	0.12	2.92	96.5	273.3	4.4	3.28	2.29	1.16	15.56±0.12	4	66	20.10±0.11	4.32±0.04	0.47	3
E0220	(140220) 2001 SH238	3.07	0.13	10.48	156.1	280.9	5.7	2.94	1.95	0.74	14.96±0.16	4	75	18.95±0.05	10.67±0.12	0.52	3
E0453	(140453) 2001 TN123	2.97	0.10	11.26	319.4	346.6	5.7	3.24	2.25	1.85	14.97±0.11	4	86	19.49±0.07	5.16±0.05	0.36	2
E0546	(140546) 2001 TZ194	3.10	0.24	17.79	155.5	268.0	6.2	2.95	1.96	1.12	14.78±0.18	2	68	18.79±0.04	5.82±0.04	0.47	3
E0924	(140924) 2001 VU67	3.10	0.03	10.62	304.8	164.4	6.0	3.02	2.08	6.39	14.86±0.16	4	102	19.29±0.06	6.36±0.04	0.55	3
E0964	(140964) 2001 VM108	3.15	0.08	3.39	312.3	20.3	5.3	3.36	2.41	4.96	15.25±0.16	4	54	20.19±0.12	3.17±0.05	0.65	2
E1162	(141162) 2001 XL127	3.18	0.12	2.91	93.6	82.2	5.2	2.94	2.00	6.66	15.19±0.30	4	71	19.46±0.08	8.50±0.07	1.03	3
E3081	(143081) 2002 XC5	2.33	0.35	9.08	117.7	240.6	1.7	2.55	1.63	9.59	15.87±0.20	4	67	19.58±0.08	9.14±0.09	0.60	3
E3205	(143205) 2002 XQ92	2.28	0.06	3.41	287.0	301.6	1.3	2.25	1.27	3.89	16.52±0.17	2	40	19.17±0.05	6.49±0.04	0.55	3
E3264	(143264) 2003 AW9	3.16	0.14	4.71	313.2	197.0	5.6	2.76	1.82	7.20	14.95±0.11	4	76	18.87±0.05	4.25±0.04	0.23	3
E3437	(143437) 2003 BY66	3.15	0.03	10.72	314.1	185.8	5.5	3.07	2.16	8.33	15.05±0.15	4	70	19.76±0.09	5.42±0.06	0.46	2
E3490	(143490) 2003 DL3	3.11	0.06	3.13	138.0	152.8	5.1	3.23	2.24	1.11	15.21±0.17	4	76	19.73±0.09	4.25±0.02	0.56	3
E4082	(144082) 2004 BP51	2.89	0.06	1.94	341.4	343.4	4.5	3.07	2.08	1.81	15.50±0.13	4	66	19.71±0.08	2.46±0.01	0.26	2
E4159	(144159) 2004 BH100	2.87	0.04	1.03	264.4	38.6	3.4	2.98	2.00	1.27	16.09±0.16	4	52	20.13±0.11	6.96±0.15	0.42	2
E4569	(144569) 2004 FO14	3.02	0.13	1.91	251.0	322.7	5.2	2.80	1.82	1.80	15.59±0.13	4	61	19.16±0.06	3.50±0.06	0.22	2
E5534	(145534) Jhongda	2.71	0.14	6.20	105.8	189.1	3.1	3.08	2.18	8.53	15.53±0.23	4	45	20.18±0.13	4.49±0.04	0.67	2
E5898	(145898) 1999 TT192	2.25	0.11	5.31	321.0	119.8	1.4	2.12	1.14	4.84	16.27±0.12	4	77	18.66±0.04	6.58±0.05	0.28	3

Table 2—Continued

Obj ID	Designation	a	e	i	Ω	ω	D	Δ	r	α	H_R	n	m	PTF_R	Period (hr)	Δm	U
E5939	(145939) 1999 XF61	2.28	0.17	4.90	97.8	289.5	1.4	2.20	1.23	6.67	16.25±0.08	2	56	18.88±0.04	3.68±0.03	0.24	3
E6010	(146010) 2000 CN78	2.31	0.17	4.98	126.8	243.4	1.0	2.34	1.36	4.73	17.04±0.27	4	65	19.93±0.11	7.16±0.05	0.93	3
E6047	(146047) 2000 EC17	2.33	0.14	2.09	336.4	200.8	1.3	2.11	1.19	12.72	16.41±0.26	4	67	19.26±0.06	11.43±0.14	0.73	3
E7548	(147548) 2004 EY59	2.27	0.14	0.93	168.5	16.4	1.2	1.99	1.00	3.23	16.64±0.13	4	76	18.49±0.04	4.71±0.02	0.19	2
E7574	(147574) 2004 FC67	2.28	0.11	4.30	111.0	27.9	1.3	2.04	1.08	6.89	16.38±0.16	3	51	18.62±0.04	3.05±0.02	0.36	2
E8208	(148208) 2000 CD101	2.29	0.07	3.84	313.4	158.3	1.2	2.16	1.18	3.98	16.57±0.11	4	75	18.99±0.05	6.91±0.10	0.24	2
E8509	(148509) 2001 ON58	2.37	0.21	3.69	293.8	24.3	1.3	2.80	1.84	4.85	16.46±0.19	3	47	20.40±0.16	16.55±0.59	0.69	2
E8539	(148539) 2001 QH102	2.34	0.07	3.20	132.1	136.8	1.3	2.49	1.52	3.08	16.50±0.14	2	52	19.65±0.08	5.45±0.12	0.41	2
E9199	(149199) 2002 PH37	2.25	0.23	5.16	316.6	37.0	1.5	2.70	1.71	1.53	16.19±0.23	4	68	19.76±0.08	5.13±0.03	0.73	3
E9265	(149265) 2002 TH53	2.33	0.26	4.33	119.4	241.7	3.6	2.45	1.50	6.73	15.92±0.14	4	73	19.23±0.06	4.02±0.03	0.31	2
E9385	(149385) 2002 YS23	2.35	0.11	7.37	108.2	272.9	1.8	2.36	1.42	8.55	15.79±0.15	4	66	18.99±0.05	3.31±0.01	0.29	2
E9405	(149405) 2003 AD57	3.08	0.17	9.03	329.8	156.1	5.6	2.60	1.61	1.00	15.04±0.16	4	93	18.22±0.03	2.97±0.01	0.28	3
E9868	(149868) 2005 QH95	2.33	0.18	3.85	116.8	209.7	1.1	2.65	1.67	2.54	16.71±0.19	4	45	20.15±0.12	11.43±0.39	0.68	2
E9913	(149913) 2005 SU73	2.33	0.18	12.10	331.7	28.0	2.0	2.68	1.69	0.72	15.55±0.18	3	58	18.97±0.05	4.25±0.04	0.38	3
F0383	(150383) 2000 DX50	2.32	0.23	3.31	172.4	81.8	1.0	2.38	1.40	5.66	16.99±0.12	4	61	20.00±0.11	3.12±0.02	0.43	2
F0789	(150789) 2001 RM31	2.33	0.09	7.29	153.1	101.1	1.3	2.38	1.40	4.84	16.41±0.24	4	85	19.34±0.06	5.22±0.03	0.78	3
F2212	(152212) 2005 RG	2.34	0.15	7.14	121.2	220.8	1.3	2.56	1.61	7.28	16.39±0.20	4	56	20.12±0.13	7.27±0.11	0.54	2
F2266	(152266) 2005 SV180	2.25	0.18	2.87	158.0	141.4	1.0	2.58	1.59	1.24	17.11±0.12	4	57	20.25±0.12	4.12±0.07	0.44	2
F3018	(153018) 2000 KN41	2.36	0.19	2.76	142.7	114.3	1.2	2.37	1.38	1.52	16.61±0.28	4	79	19.45±0.08	4.62±0.02	0.86	3
F3027	(153027) 2000 OP	2.42	0.21	2.37	102.4	166.2	1.2	2.79	1.87	8.70	16.55±0.17	4	39	20.69±0.15	2.19±0.01	0.62	2
F3042	(153042) 2000 QP14	2.52	0.12	2.45	115.2	256.9	3.1	2.55	1.58	5.30	15.56±0.10	3	69	19.08±0.05	3.15±0.04	0.20	2
F3412	(153412) 2001 QR145	2.41	0.18	1.79	161.5	225.0	0.9	2.31	1.34	5.28	17.17±0.15	4	66	19.77±0.09	4.36±0.08	0.45	2
F3462*	(153462) 2001 RE2	2.30	0.20	22.87	331.6	246.5	3.9	2.05	1.06	2.07	15.79±0.14	4	78	17.65±0.02	11.16±0.13	0.43	3
F3633	(153633) 2001 TM64	2.44	0.19	1.42	210.7	138.8	1.4	2.63	1.65	3.49	16.35±0.16	4	62	19.85±0.10	3.98±0.03	0.47	2
F3634	(153634) 2001 TS65	2.44	0.17	1.03	185.6	236.1	1.4	2.36	1.37	2.15	16.23±0.13	3	57	18.92±0.05	9.14±0.17	0.31	3
F3654	(153654) 2001 TB113	2.39	0.18	1.90	306.6	346.3	1.2	2.81	1.86	6.88	16.60±0.17	4	26	20.68±0.16	4.47±82.81	0.51	2
F3748	(153748) 2001 UB161	2.37	0.21	3.32	124.7	189.2	1.5	2.83	1.84	1.12	16.16±0.30	4	72	19.89±0.10	5.55±0.03	1.10	3
F3804	(153804) 2001 VO113	2.40	0.22	1.53	315.9	17.7	1.4	2.92	1.94	2.22	16.32±0.15	4	59	20.32±0.12	6.86±0.10	0.47	2
F3881	(153881) 2001 XH148	2.47	0.19	3.44	128.2	196.4	1.8	2.84	1.87	3.98	15.70±0.13	4	64	19.66±0.09	5.13±0.08	0.41	2
F4382 ^b	(154382) 2002 YS26	2.36	0.13	1.98	315.4	152.3	1.0	2.06	1.12	11.85	17.11±0.23	4	61	19.59±0.08	7.62±0.06	0.73	3
F4475	(154475) 2003 EU2	2.38	0.13	1.47	14.4	198.5	1.0	2.19	1.20	0.96	16.94±0.19	3	54	19.16±0.05	13.15±0.18	0.50	2
F4487	(154487) 2003 EZ35	2.41	0.11	7.61	151.4	128.3	2.6	2.56	1.57	2.19	15.72±0.21	4	73	19.00±0.05	5.75±0.03	0.56	3

Table 2—Continued

Obj ID	Designation	a	e	i	Ω	ω	D	Δ	r	α	H_R	n	m	PTF_R	Period (hr)	Δm	U
F4713	(154713) 2004 LA2	2.43	0.20	5.45	298.0	348.4	1.6	2.90	1.94	4.79	16.01±0.13	4	60	20.20±0.13	8.89±0.32	0.51	2
F4998	(154998) 2005 NN1	2.35	0.23	3.18	122.7	213.1	1.2	2.70	1.74	4.91	16.70±0.14	4	68	20.37±0.12	2.62±0.03	0.50	2
F5006	(155006) 2005 OU14	2.33	0.22	7.48	156.8	197.5	1.3	2.76	1.78	4.50	16.49±0.21	3	38	20.34±0.11	7.93±0.19	0.66	2
F5060	(155060) 2005 SG28	2.31	0.11	6.64	341.7	0.5	1.3	2.56	1.58	1.07	16.43±0.25	2	30	19.70±0.10	10.21±0.32	0.61	2
F5712	(155712) 2000 QA175	2.48	0.10	5.32	309.5	341.4	1.6	2.74	1.78	5.81	15.98±0.17	4	59	19.95±0.10	3.17±0.04	0.45	2
F5759	(155759) 2000 SG140	2.57	0.14	2.71	279.9	84.1	2.2	2.62	1.64	2.62	16.27±0.16	4	65	19.69±0.09	6.62±0.09	0.47	2
F6025	(156025) 2001 RD115	2.39	0.16	2.93	137.6	336.5	1.2	2.06	1.07	1.84	16.69±0.12	3	56	18.50±0.04	3.15±0.02	0.21	2
F6172	(156172) 2001 TG159	2.45	0.17	0.97	186.9	244.2	0.8	2.12	1.14	4.63	17.58±0.23	2	47	19.87±0.09	6.15±0.04	0.80	3
F6765	(156765) 2003 AZ28	2.36	0.13	2.73	154.3	357.9	1.2	2.06	1.07	1.39	16.61±0.11	4	116	18.45±0.03	7.38±0.12	0.21	2
F6912	(156912) 2003 FS25	2.45	0.16	0.77	352.4	272.2	1.1	2.75	1.80	7.03	16.72±0.16	4	39	20.66±0.14	2.66±0.04	0.51	2
F7527	(157527) 2005 SU265	2.35	0.18	0.59	285.7	126.3	0.7	2.35	1.36	0.64	17.70±0.21	4	49	20.36±0.13	6.11±0.04	0.93	3
F8235	(158235) 2001 SV293	2.42	0.14	2.00	25.3	84.4	0.9	2.08	1.14	10.04	17.15±0.21	4	60	19.62±0.08	11.57±0.43	0.65	2
F9151	(159151) 2004 XD109	2.62	0.16	1.15	88.9	252.6	2.6	2.87	1.90	4.19	15.92±0.15	4	89	19.96±0.10	7.56±0.17	0.45	3
F9410	(159410) 1999 RU122	2.64	0.26	14.27	148.6	209.8	5.9 ^W	3.14	2.17	3.28	15.66±0.20	4	61	20.00±0.12	6.62±0.05	0.65	3
F9414	(159414) 1999 RN178	2.66	0.38	5.30	149.2	222.7	3.0	3.24	2.26	0.42	15.62±0.24	4	69	20.05±0.11	8.73±0.08	0.76	3
F9505	(159505) 2000 WP77	2.52	0.18	3.93	301.4	23.4	2.4	2.98	2.00	2.75	16.08±0.19	4	56	20.28±0.12	4.66±0.04	0.71	3
F9799	(159799) Kralice	2.72	0.09	12.65	306.3	58.1	5.3 ^W	2.80	1.85	6.59	15.28±0.06	3	84	19.33±0.06	8.42±0.23	0.22	2
G0022	(160022) 1995 YL11	2.33	0.12	3.22	152.5	355.1	2.7 ^W	2.06	1.07	1.93	17.27±0.11	4	70	19.27±0.06	5.49±0.10	0.19	2
G0149	(160149) 2001 LC10	2.28	0.12	6.51	152.7	151.7	1.2	2.53	1.54	3.62	16.68±0.11	2	42	19.92±0.08	2.50±0.03	0.28	2
G0345	(160345) 2003 SJ175	2.65	0.03	2.91	169.0	37.4	2.6	2.61	1.63	3.43	15.95±0.11	4	73	19.33±0.07	13.52±0.37	0.28	2
G0468	(160468) 2006 DZ67	2.62	0.13	11.09	107.5	178.6	3.8	2.95	1.99	5.49	15.08±0.24	2	40	19.44±0.07	3.31±0.01	0.61	3
G0559	(160559) 1998 RS55	2.77	0.14	5.98	327.2	5.0	5.7 ^W	3.09	2.15	6.70	15.31±0.19	3	34	19.78±0.08	7.80±0.20	0.40	2
G0615	(160615) 1999 TG97	2.61	0.14	12.32	149.9	185.0	3.7 ^W	2.97	1.98	1.34	15.59±0.13	4	75	19.60±0.08	4.66±0.05	0.39	2
G1103	(161103) 2002 PT169	2.31	0.26	1.17	115.6	307.0	0.8	1.82	0.84	3.67	17.62±0.24	4	71	18.91±0.05	7.80±0.06	0.64	3
G1227	(161227) 2002 XO68	2.94	0.21	11.30	159.0	232.5	5.7	3.13	2.14	1.09	14.98±0.16	4	72	19.42±0.07	8.73±0.16	0.29	2
G1391	(161391) 2003 UF97	2.77	0.09	1.55	70.9	304.9	3.4 ^W	2.80	1.84	5.78	16.26±0.18	4	52	20.42±0.14	4.47±0.08	0.49	2
G1495	(161495) 2004 MA1	2.36	0.20	23.09	111.5	103.2	1.6	2.38	1.40	2.45	16.05±0.20	4	71	19.06±0.06	9.70±0.10	0.66	3
G1912	(161912) 2007 DY97	2.41	0.15	1.53	235.3	352.2	1.1	2.50	1.53	4.52	16.83±0.20	4	54	20.10±0.13	4.87±0.10	0.86	2
G2066	(162066) 1997 MU8	2.87	0.13	4.61	288.3	99.4	4.4	2.82	1.86	5.36	15.55±0.14	4	64	19.58±0.08	5.45±0.24	0.32	2
G2138	(162138) 1998 UY13	2.76	0.10	1.83	172.7	160.9	2.7	3.02	2.04	0.91	15.87±0.17	4	78	19.88±0.09	2.56±0.01	0.50	2
G2809 ^b	(162809) 2001 AW34	2.62	0.14	4.34	326.1	200.2	2.1 ^W	2.26	1.28	2.03	15.81±0.21	4	82	18.24±0.03	5.55±0.03	0.63	3
G3434	(163434) 2002 RY72	2.86	0.20	10.91	339.2	81.1	4.9	2.82	1.83	1.46	15.30±0.15	1	24	19.03±0.04	7.22±0.40	0.49	2

Table 2—Continued

Obj ID	Designation	a	e	i	Ω	ω	D	Δ	r	α	H_R	n	m	PTF_R	Period (hr)	Δm	U
G3502	(163502) 2002 SA46	2.97	0.21	3.95	116.3	268.2	3.9	2.85	1.89	4.75	15.82±0.17	3	61	19.84±0.09	3.89±0.06	0.42	2
G3934	(163934) 2003 SG311	2.75	0.25	1.47	332.7	142.2	3.2	2.17	1.18	1.25	15.63±0.16	4	84	17.91±0.02	8.42±0.07	0.28	3
G3974	(163974) 2003 UC109	2.73	0.07	6.20	308.9	49.6	2.5	2.88	1.91	4.87	16.01±0.14	2	39	20.06±0.11	2.50±0.03	0.41	2
G4013	(164013) 2003 UT197	2.70	0.05	1.45	170.0	350.3	2.5	2.57	1.58	0.58	16.05±0.19	4	99	19.18±0.06	5.93±0.04	0.61	3
G4025	(164025) 2003 UH226	2.79	0.03	3.16	276.9	176.4	4.7	2.72	1.74	2.83	15.76±0.18	4	73	19.31±0.08	3.58±0.03	0.46	3
G4079	(164079) 2003 WS94	2.75	0.07	1.70	304.2	103.7	3.5	2.79	1.80	0.74	16.31±0.27	4	67	19.93±0.09	5.30±0.03	0.94	3
G4080	(164080) 2003 WJ96	2.78	0.08	0.88	57.6	288.8	3.5	2.91	1.97	6.13	16.25±0.17	3	49	20.47±0.15	2.66±0.03	0.56	2
G4405	(164405) 2005 UK504	2.57	0.15	13.75	325.7	270.6	2.3	2.49	1.51	2.93	15.71±0.21	4	77	18.74±0.04	16.84±0.29	0.67	3
G4482	(164482) 2006 FG24	2.62	0.11	3.58	164.8	104.2	2.4	2.71	1.73	0.66	16.46±0.14	4	58	20.05±0.10	4.32±0.04	0.40	2
G4625	(164625) 1993 TC15	2.80	0.09	4.44	178.8	183.9	4.4	2.99	2.02	4.71	15.89±0.10	3	38	20.06±0.11	6.32±0.16	0.37	2
G4874	(164874) 1999 UL37	2.64	0.08	1.54	74.9	136.7	2.3	2.65	1.69	5.97	16.22±0.11	2	36	19.91±0.10	6.11±0.16	0.42	2
G5552	(165552) 2001 DS42	2.66	0.11	13.33	335.3	211.1	2.2	2.41	1.42	0.68	15.70±0.16	4	70	18.51±0.03	5.42±0.03	0.50	3
G5755	(165755) 2001 QK207	3.06	0.20	1.69	135.1	232.2	4.2	3.14	2.18	4.05	15.65±0.16	3	36	20.16±0.12	5.36±0.12	0.38	2
G5785	(165785) 2001 RT5	3.10	0.14	2.51	307.9	98.6	6.2	2.87	1.89	2.66	15.25±0.18	3	48	19.21±0.06	4.71±0.07	0.42	2
G6572	(166572) 2002 RU120	2.91	0.12	3.29	326.1	103.2	4.3	2.65	1.70	6.64	15.58±0.17	4	70	19.33±0.06	7.62±0.18	0.26	2
G6653	(166653) 2002 TT20	2.86	0.08	2.05	173.4	207.5	2.8	2.99	2.00	2.31	16.51±0.15	4	50	20.50±0.15	7.27±0.17	0.61	2
G6808	(166808) 2002 VS75	3.00	0.10	5.84	116.0	283.0	4.7	2.90	1.94	4.26	15.39±0.27	4	78	19.49±0.07	3.53±0.01	0.81	3
G7257	(167257) 2003 UG118	2.72	0.05	4.32	316.1	213.4	3.1	2.63	1.69	7.71	15.64±0.17	4	64	19.38±0.07	4.38±0.02	0.61	3
G7870	(167870) 2005 EP27	2.77	0.08	4.67	162.6	157.9	3.9	3.00	2.02	3.15	15.72±0.16	4	63	19.89±0.10	18.11±0.35	0.55	2
G9114	(169114) 2001 OK47	3.00	0.20	4.56	317.7	12.6	7.1	3.48	2.53	5.04	14.76±0.22	4	45	20.10±0.12	6.86±0.10	0.56	2
G9964	(169964) 2002 TD130	2.86	0.07	7.59	110.2	229.6	5.3	3.02	2.10	8.38	15.16±0.15	4	69	19.66±0.08	3.79±0.03	0.34	2
H0133	(170133) 2003 AB36	3.05	0.16	12.36	109.1	279.1	5.6	2.92	1.95	2.99	15.04±0.20	4	53	19.10±0.06	4.12±0.02	0.55	3
H0845	(170845) 2004 FK65	3.05	0.20	2.73	128.5	27.9	4.6	2.55	1.58	5.23	15.46±0.06	1	26	18.85±0.04	4.25±0.30	0.16	2
H1069	(171069) 2005 ES152	2.88	0.05	3.32	95.9	239.5	3.6	3.02	2.12	8.93	15.99±0.20	4	47	20.59±0.15	4.32±0.06	0.55	2
H1257	(171257) 2005 QP77	3.26	0.10	2.28	72.6	219.5	5.0	3.59	2.64	5.02	15.28±0.16	4	47	20.54±0.14	2.26±0.02	0.51	2
H1879	(171879) 2001 QQ263	3.10	0.15	9.47	314.9	111.1	6.6	2.93	1.96	4.79	14.68±0.11	4	74	18.89±0.05	15.00±0.23	0.31	2
H1888	(171888) 2001 RJ20	2.98	0.11	3.68	321.6	69.4	3.8	3.12	2.13	0.68	15.86±0.11	3	41	19.98±0.10	3.09±0.02	0.39	2
H2402	(172402) 2003 BJ51	3.11	0.17	4.49	302.0	224.9	5.2	2.60	1.63	4.49	15.18±0.22	4	73	18.64±0.04	8.73±0.08	0.67	3
H2797	(172797) 2004 FN103	3.00	0.04	2.63	177.1	0.1	3.6	2.88	1.89	0.82	15.98±0.15	4	71	19.77±0.09	8.73±0.16	0.45	2
H3464	(173464) 2000 QX154	3.18	0.17	25.94	295.5	66.6	7.5	3.31	2.35	3.82	14.51±0.16	4	71	19.27±0.06	9.06±0.09	0.46	3
H3871 ^b	(173871) 2001 TW235	3.07	0.09	10.83	154.0	230.9	5.0	3.22	2.23	0.83	15.25±0.28	4	87	19.67±0.08	5.27±0.03	0.94	3
H3991*	(173991) 2001 XR170	3.15	0.18	0.27	131.2	263.0	4.1	3.35	2.37	0.53	15.69±0.16	4	54	20.25±0.13	9.14±0.18	0.49	2

Table 2—Continued

Obj ID	Designation	a	e	i	Ω	ω	D	Δ	r	α	H_R	n	m	PTF_R	Period (hr)	Δm	U
H4473	(174473) 2003 AX16	3.10	0.14	4.03	270.5	154.0	3.6	2.77	1.79	2.90	15.99±0.14	4	59	19.71±0.10	3.16±0.04	0.34	2
H4511	(174511) 2003 BH77	3.12	0.24	17.14	117.8	290.9	4.6	2.79	1.88	9.51	15.45±0.21	4	59	19.68±0.09	5.03±0.05	0.59	2
H4680	(174680) 2003 SC304	2.67	0.16	11.19	307.8	324.7	3.0	3.03	2.10	7.34	15.39±0.25	2	50	19.92±0.09	4.36±0.02	0.79	3
H4946	(174946) 2004 CF85	2.98	0.15	9.55	296.1	306.9	5.8	3.18	2.23	5.03	15.24±0.16	4	66	19.88±0.11	9.32±0.18	0.56	2
H5313	(175313) 2005 MF15	3.24	0.14	1.84	205.4	91.7	5.2	3.70	2.72	2.44	15.15±0.23	4	44	20.40±0.14	4.92±0.08	0.77	2
H5347	(175347) 2005 NV122	3.17	0.06	8.47	314.8	151.1	5.4	3.03	2.05	3.35	15.18±0.15	4	74	19.44±0.08	7.27±0.05	0.39	3
H6988 ^b	(176988) 2002 YR29	3.12	0.05	7.31	295.4	186.0	5.3	2.97	2.01	4.75	15.14±0.28	4	68	19.42±0.07	7.74±0.06	0.91	3
H7002	(177002) 2003 AG59	3.15	0.24	16.78	118.3	43.8	6.5	2.52	1.58	8.35	14.71±0.16	4	70	18.23±0.03	3.14±0.02	0.30	3
H7054	(177054) 2003 EY35	3.16	0.09	2.35	95.4	62.3	4.3	2.88	1.90	1.07	15.57±0.15	2	22	19.44±0.09	2.72±0.03	0.45	2
H7109	(177109) 2003 GZ2	3.17	0.13	6.08	348.9	283.3	6.1	3.31	2.32	1.13	14.93±0.15	4	80	19.57±0.07	11.85±0.14	0.47	2
H7726	(177726) 2005 HX4	2.21	0.11	4.76	116.2	176.2	1.1	2.46	1.48	2.41	16.81±0.16	3	58	19.83±0.10	4.97±0.08	0.44	2
H9138	(179138) 2001 SU316	3.05	0.10	8.70	316.6	44.5	4.4	3.19	2.25	6.63	15.55±0.29	4	49	20.29±0.12	3.72±0.03	0.96	3
I0203	(180203) 2003 SU259	2.17	0.13	0.99	93.9	291.6	0.9	2.11	1.13	2.72	17.35±0.12	3	62	19.57±0.08	5.25±0.08	0.26	2
I1570	(181570) 2006 VZ21	2.17	0.12	2.61	289.2	310.4	0.9	2.31	1.33	3.00	17.31±0.21	4	51	20.07±0.11	10.43±0.35	0.64	2
I1966	(181966) 1999 UA42	2.23	0.21	4.57	327.7	7.2	1.7	2.59	1.68	9.70	16.61±0.12	2	46	20.37±0.13	2.24±0.03	0.43	2
I3130	(183130) 2002 RR201	2.22	0.12	3.49	116.5	164.0	1.1	2.48	1.52	6.41	16.80±0.14	3	53	20.15±0.11	3.60±0.04	0.37	2
I3597	(183597) 2003 UT14	2.74	0.04	3.42	204.1	232.4	2.6	2.70	1.72	4.36	15.97±0.26	4	67	19.69±0.09	9.60±0.10	0.95	3
I3609	(183609) 2003 UV160	2.13	0.10	1.84	239.1	114.0	0.8	2.32	1.34	4.28	17.52±0.19	4	58	20.38±0.11	5.39±0.03	0.70	3
I4384	(184384) 2005 LA18	2.20	0.09	6.03	107.0	331.7	1.1	2.04	1.13	13.67	16.90±0.19	3	56	19.46±0.07	6.00±0.07	0.56	3
I5086*	(185086) 2006 RP92	3.09	0.07	1.15	300.2	66.1	3.7	3.25	2.27	2.80	15.90±0.25	3	36	20.51±0.13	7.68±0.19	0.97	2
I5199	(185199) 2006 TB25	3.13	0.10	0.83	341.5	37.2	4.1	3.34	2.35	1.06	15.70±0.12	4	52	20.45±0.14	7.74±0.52	0.44	2
I5225	(185225) 2006 TV74	3.20	0.15	0.70	20.2	25.2	3.5	3.28	2.29	0.42	16.06±0.22	4	60	20.48±0.12	9.06±0.17	0.74	2
I5506	(185506) 2007 TJ315	3.02	0.12	1.16	68.6	316.5	3.9	2.99	2.02	4.68	15.82±0.27	4	65	20.11±0.12	10.00±0.20	0.92	2
I5570	(185570) 2008 AA78	3.18	0.06	1.96	4.3	103.9	4.1	3.03	2.04	0.80	15.71±0.21	4	76	19.94±0.11	9.14±0.09	0.74	3
I5704	(185704) 1998 OD8	2.34	0.26	3.55	277.8	84.0	3.4	2.43	1.46	5.01	16.27±0.26	4	67	19.44±0.07	7.93±0.07	0.85	3
I5943	(185943) 2000 YB98	2.20	0.14	3.43	102.3	57.3	1.2	1.96	0.99	8.23	16.66±0.10	4	80	18.73±0.04	4.92±0.08	0.24	2
I5951	(185951) 2001 DE8	2.19	0.16	8.32	148.8	125.9	1.2	2.34	1.35	0.88	16.59±0.12	1	18	19.26±0.07	2.30±0.12	0.41	2
I6454 ^b	(186454) 2002 SU55	2.29	0.15	4.51	128.0	219.6	1.3	2.45	1.48	3.80	16.52±0.24	4	63	19.65±0.09	6.15±0.04	0.78	3
I6490	(186490) 2002 TB222	2.22	0.18	1.99	234.7	74.1	1.1	2.58	1.59	2.43	16.90±0.25	4	56	20.29±0.12	5.05±0.03	0.83	3
I6772	(186772) 2004 DQ20	2.28	0.08	6.36	113.6	295.7	1.3	2.19	1.21	3.47	16.39±0.19	4	75	18.82±0.05	5.52±0.03	0.52	3
I7926	(187926) 2001 BH31	2.19	0.10	4.17	153.4	347.9	1.3	1.98	0.99	1.12	16.46±0.12	4	72	18.09±0.03	2.69±0.01	0.17	3
I7931	(187931) 2001 DN107	2.21	0.02	7.02	118.6	90.2	1.2	2.22	1.25	7.23	16.68±0.19	3	58	19.42±0.07	4.95±0.03	0.64	3

Table 2—Continued

Obj ID	Designation	a	e	i	Ω	ω	D	Δ	r	α	H_R	n	m	PTF_R	Period (hr)	Δm	U
I7975	(187975) 2001 QQ155	2.40	0.20	3.27	273.8	64.8	1.2	2.68	1.71	4.12	16.68±0.16	4	42	20.34±0.14	2.89±0.03	0.69	2
I8645	(188645) 2005 RL33	2.34	0.23	8.82	115.4	213.7	1.8	2.80	1.89	9.55	15.75±0.18	4	52	20.18±0.11	4.97±0.05	0.76	2
I9427	(189427) 1997 TE5	2.39	0.21	3.74	326.2	28.3	1.3	2.83	1.85	0.96	16.38±0.20	4	58	20.21±0.11	8.14±0.21	0.62	2
I9740	(189740) 2001 XA80	2.44	0.14	6.93	145.1	243.6	1.4	2.59	1.60	1.16	16.29±0.14	4	67	19.49±0.07	9.32±0.09	0.37	3
J0007	(190007) 2004 LM13	2.38	0.16	3.38	117.5	148.7	1.1	2.70	1.72	3.00	16.76±0.20	4	54	20.37±0.14	5.19±0.11	0.68	2
J0186	(190186) 2005 WM31	2.43	0.13	1.89	318.9	173.1	1.2	2.14	1.15	0.76	16.59±0.14	4	80	18.65±0.04	14.77±0.22	0.27	3
J0580	(190580) 2000 SB295	2.60	0.35	3.75	310.6	61.1	2.8	2.60	1.68	8.91	15.80±0.15	3	60	19.63±0.08	2.73±0.03	0.35	2
J0584	(190584) 2000 SH311	2.55	0.24	12.03	296.0	24.3	4.7 ^W	3.10	2.15	5.71	15.20±0.16	4	66	19.75±0.10	5.36±0.09	0.49	2
J0629	(190629) 2000 WT114	2.59	0.28	4.15	15.9	29.4	2.6	2.65	1.66	2.02	15.93±0.24	2	44	19.38±0.06	5.71±0.03	0.71	3
J0658	(190658) 2000 YA44	2.65	0.15	1.44	148.9	274.8	2.3	2.35	1.37	4.03	16.17±0.15	4	78	19.07±0.05	6.27±0.12	0.26	2
J0663	(190663) 2000 YF88	2.59	0.22	1.46	206.1	156.0	2.6	3.02	2.03	2.00	15.95±0.16	4	76	20.02±0.10	14.55±0.22	0.48	2
J1029	(191029) 2002 BR	2.54	0.12	4.73	310.9	201.5	2.0 ^W	2.29	1.35	9.89	15.52±0.11	4	77	18.57±0.04	2.71±0.02	0.20	2
J2224	(192224) 2007 VO6	5.23	0.06	14.99	153.1	193.6	10.7 ^W	5.53	4.54	0.22	12.90±0.13	4	70	20.02±0.10	5.82±0.07	0.39	2
J2390	(192390) 1996 RO30	5.23	0.02	9.49	326.3	134.5	13.4	5.16	4.17	0.36	13.12±0.12	4	74	19.90±0.09	5.65±0.10	0.30	2
J2451	(192451) 1997 WQ42	2.47	0.18	2.37	16.7	60.7	1.5	2.31	1.33	2.83	16.11±0.15	2	43	18.95±0.04	5.39±0.06	0.23	2
J2651	(192651) 1999 RS80	2.66	0.19	1.42	230.4	205.1	4.5 ^W	2.42	1.44	3.73	15.99±0.23	4	74	19.09±0.05	4.73±0.02	0.60	3
J2767 ^b	(192767) 1999 TV319	2.70	0.14	1.68	202.0	308.6	3.4 ^W	2.37	1.40	3.51	16.59±0.25	4	71	19.52±0.09	7.74±0.06	0.80	3
J2775	(192775) 1999 UE16	2.70	0.20	1.40	257.7	171.1	2.1	2.50	1.51	3.47	16.35±0.19	4	66	19.49±0.08	3.98±0.02	0.53	3
J2869	(192869) 1999 XB14	2.73	0.34	8.05	138.6	284.3	2.4	2.43	1.44	1.65	16.08±0.15	4	71	19.00±0.06	3.90±0.02	0.40	3
J2940	(192940) 2000 AG206	2.78	0.07	5.58	104.5	301.7	5.0 ^W	2.69	1.71	2.37	15.42±0.19	3	49	18.89±0.06	6.11±0.08	0.69	2
J3199	(193199) 2000 QL139	2.47	0.24	9.84	162.5	159.4	1.3	3.06	2.08	3.65	16.43±0.13	4	41	20.83±0.17	5.78±0.11	0.41	2
J3308	(193308) 2000 SG300	2.56	0.09	3.15	284.7	100.5	1.9	2.53	1.55	3.29	16.63±0.23	4	62	19.92±0.11	7.11±0.10	0.73	2
J3467	(193467) 2000 XK17	2.62	0.10	9.27	306.3	153.6	2.4 ^W	2.37	1.42	8.09	15.48±0.15	4	75	18.83±0.05	6.49±0.04	0.50	3
J3470	(193470) 2000 XU19	2.59	0.17	11.78	311.5	102.6	3.4	2.53	1.56	4.64	15.38±0.12	4	60	18.72±0.05	2.87±0.02	0.28	2
J3505	(193505) 2000 YP36	2.64	0.21	3.60	293.5	146.0	4.5 ^W	2.16	1.19	5.66	15.28±0.14	3	53	17.89±0.02	2.95±0.03	0.09	2
J3529	(193529) 2000 YV86	2.62	0.19	1.93	258.2	192.1	2.4	2.29	1.31	4.09	16.10±0.11	3	46	18.90±0.05	4.00±0.05	0.19	2
J3577	(193577) 2001 BY1	2.62	0.19	5.39	140.0	315.8	2.1	2.31	1.32	2.60	16.42±0.15	2	26	19.07±0.05	5.96±0.04	0.51	2
J3622	(193622) 2001 CR25	2.70	0.21	12.41	117.0	274.0	3.5	2.49	1.52	3.97	15.30±0.09	2	54	18.52±0.03	12.80±0.35	0.27	3
J3659	(193659) 2001 DX53	2.68	0.30	2.96	316.1	131.6	2.3	1.92	0.95	7.64	16.20±0.11	4	73	18.04±0.02	3.23±0.01	0.18	3
J5098	(195098) 2002 CE125	2.52	0.07	2.96	200.6	293.6	2.1	2.35	1.37	4.06	16.36±0.11	4	70	19.21±0.06	2.62±0.01	0.34	2
J5123	(195123) 2002 CG157	2.56	0.11	0.63	313.8	337.7	2.4	2.83	1.87	4.79	16.14±0.15	4	66	20.05±0.11	2.98±0.03	0.46	2
J5475	(195475) 2002 GQ126	2.59	0.10	1.19	169.5	356.2	1.6	2.43	1.45	3.29	17.05±0.16	4	50	20.07±0.13	3.65±0.06	0.48	2

Table 2—Continued

Obj ID	Designation	a	e	i	Ω	ω	D	Δ	r	α	H_R	n	m	PTF_R	Period (hr)	Δm	U
J5602	(195602) 2002 KN1	2.62	0.13	3.09	276.7	297.0	1.9	2.65	1.67	3.65	16.65±0.16	2	41	20.19±0.11	10.91±0.36	0.46	2
J6325	(196325) 2003 FL47	2.41	0.14	0.72	192.5	38.4	0.8	2.30	1.32	1.15	17.55±0.20	4	85	19.74±0.09	9.60±0.10	0.62	3
J6444 ^b	(196444) 2003 HQ37	2.44	0.22	3.38	274.8	274.7	1.1	2.21	1.24	5.47	16.76±0.20	4	76	19.26±0.06	4.49±0.02	0.62	3
J6667	(196667) 2003 SN50	2.69	0.02	5.32	295.5	174.7	2.7	2.63	1.66	4.80	15.88±0.14	4	81	19.48±0.07	4.82±0.07	0.28	2
J7518	(197518) 2004 CJ106	3.06	0.07	13.33	293.0	351.4	6.2	3.26	2.28	1.81	14.81±0.14	2	49	19.37±0.06	6.15±0.08	0.48	2
J7715	(197715) 2004 PS7	2.39	0.19	2.16	298.7	347.9	1.2	2.70	1.73	4.35	16.69±0.22	4	60	20.35±0.12	5.13±0.03	0.85	3
J8184	(198184) 2004 TU109	2.62	0.17	12.86	118.7	269.8	5.1	2.49	1.52	3.60	15.32±0.13	4	72	18.50±0.04	4.27±0.06	0.15	2
J8468	(198468) 2004 XE24	2.63	0.15	2.72	127.5	250.1	2.1	2.65	1.70	7.06	16.38±0.21	4	56	20.10±0.11	6.81±0.10	0.70	2
J9091	(199091) 2005 YF10	2.44	0.14	1.32	216.0	297.2	0.8	2.11	1.14	6.58	17.51±0.17	3	49	19.82±0.09	6.76±0.15	0.49	2
J9283	(199283) 2006 BW46	2.53	0.14	3.16	306.8	327.4	2.2	2.70	1.71	3.12	16.34±0.12	2	37	19.95±0.10	6.40±0.17	0.44	2
K0192	(200192) 1999 RT119	2.60	0.21	5.29	174.3	170.8	3.0	3.11	2.13	3.24	15.61±0.11	4	58	20.01±0.10	3.05±0.95	0.26	2
K01B06K	2001 BK6	2.65	0.20	12.08	305.9	216.4	2.0	2.22	1.29	10.67	16.46±0.21	4	68	19.07±0.06	5.05±0.03	0.43	2
K01SO6T	2001 ST246	2.45	0.20	2.18	128.3	246.9	0.9	2.41	1.43	3.26	17.36±0.18	4	49	20.25±0.13	3.47±0.04	0.52	2
K0256	(200256) 1999 VQ225	2.71	0.18	6.00	118.3	240.4	2.3	2.83	1.86	3.30	16.21±0.11	3	49	19.91±0.10	5.96±0.19	0.25	2
K03D09T	2003 DT9	3.16	0.27	16.73	116.4	334.0	3.8	2.35	1.39	6.77	15.86±0.15	4	80	18.92±0.05	18.82±0.38	0.37	2
K03WF6N	2003 WN156	2.90	0.49	9.83	156.7	331.6	1.8	1.52	0.55	9.80	17.49±0.06	2	42	17.73±0.02	10.43±0.43	0.12	2
K05EN7L	2005 EL237	2.86	0.02	2.98	135.6	32.5	2.3	2.82	1.85	3.54	16.95±0.24	4	32	20.77±0.15	3.52±0.08	0.70	2
K05SE6K	2005 SK146	2.36	0.13	5.53	337.5	72.2	0.9	2.39	1.40	0.55	17.28±0.24	4	66	20.05±0.11	10.43±0.22	0.74	3
K05T61L	2005 TL61	2.39	0.21	4.57	0.3	86.0	2.2	2.12	1.14	1.89	17.59±0.10	2	48	19.60±0.08	7.68±0.19	0.29	2
K05YJ1Q		2.54	0.27	8.42	108.6	269.7	1.6	2.41	1.43	3.92	16.95±0.25	4	48	19.96±0.12	8.50±0.15	0.88	2
K06A62F	2006 AF62	2.48	0.13	2.65	203.6	42.7	0.8	2.49	1.51	4.88	17.41±0.25	2	21	20.68±0.15	1.57±0.01	0.84	2
K06BC7H	2006 BH127	2.53	0.08	14.18	151.2	357.8	1.6	2.34	1.35	1.07	16.93±0.15	2	64	19.57±0.07	4.53±0.06	0.56	3
K06K18Z	2006 KZ18	2.65	0.09	14.37	148.1	149.2	2.2	2.84	1.86	0.93	16.27±0.18	4	59	20.03±0.12	6.76±0.10	0.53	2
K06M10N	2006 MN10	3.05	0.11	10.03	285.7	83.0	3.6	3.11	2.13	3.49	16.00±0.20	3	27	20.42±0.16	8.73±0.31	0.70	2
K06S59N		2.20	0.19	4.10	106.4	261.9	0.8	2.26	1.30	7.49	17.57±0.15	2	45	20.42±0.13	3.54±0.05	0.53	2
K06TB7X	2006 TX117	3.15	0.08	13.27	152.4	54.9	2.9	3.01	2.03	2.94	16.46±0.20	2	22	20.71±0.14	3.04±0.04	0.69	2
K07D83M		2.37	0.17	2.22	113.3	289.9	0.8	2.16	1.19	5.38	17.46±0.18	2	46	19.91±0.11	6.81±0.10	0.80	2
K07E68P	2007 EP68	2.35	0.08	4.63	155.2	44.2	0.7	2.22	1.23	1.08	17.80±0.17	4	56	20.14±0.11	7.06±0.10	0.63	2
K07E74Z	2007 EZ74	2.36	0.14	0.50	310.5	285.3	0.6	2.28	1.30	1.47	17.95±0.25	4	60	20.50±0.14	8.07±0.13	0.82	2
K07EF9W	2007 EW159	2.37	0.11	3.36	88.2	33.9	0.8	2.11	1.15	8.63	17.44±0.20	4	60	19.94±0.10	6.76±0.09	0.80	3
K07F36N		2.40	0.19	0.22	38.5	27.8	0.7	2.08	1.14	11.07	17.86±0.18	2	38	20.41±0.14	5.16±0.08	0.66	2
K07P45U	2007 PU45	2.55	0.19	8.39	142.8	133.8	1.7	2.74	1.76	1.02	16.88±0.23	3	42	20.36±0.14	6.08±0.12	0.75	2

Table 2—Continued

Obj ID	Designation	a	e	i	Ω	ω	D	Δ	r	α	H_R	n	m	PTF_R	Period (hr)	Δm	U
K07RG2V	2007 RV162	2.80	0.14	9.65	340.8	106.0	1.7	2.60	1.61	0.65	16.91±0.10	1	20	20.09±0.09	6.11±0.60	0.31	2
K08TA5K		2.65	0.09	1.97	353.6	72.0	1.4	2.49	1.55	8.25	17.24±0.20	2	33	20.72±0.16	4.95±0.08	0.58	2
K08U67A		2.74	0.18	2.50	319.3	116.6	1.2	2.35	1.42	9.63	17.62±0.15	2	24	20.87±0.15	6.11±0.11	0.52	2
K08UO2K	2008 UK242	2.66	0.27	13.66	150.3	252.6	1.6	2.73	1.74	0.58	17.03±0.15	2	31	20.48±0.15	3.78±0.08	0.41	2
K08UZ2V		2.80	0.14	3.78	279.7	164.4	2.4	2.46	1.49	4.53	16.90±0.17	4	50	20.16±0.14	8.89±0.25	0.62	2
K08Y20A	2008 YA20	2.95	0.09	10.59	115.4	317.3	2.4	2.75	1.79	4.91	16.88±0.20	4	43	20.72±0.17	2.51±0.04	0.67	2
K09A32W	2009 AW32	3.00	0.10	4.32	122.9	316.8	2.3	2.75	1.78	3.75	16.99±0.15	4	39	20.74±0.16	2.67±0.04	0.48	2
K09F61L	2009 FL61	3.11	0.12	1.64	53.9	157.8	2.8	2.89	1.90	1.02	16.51±0.13	4	47	20.35±0.14	3.64±0.06	0.56	2
K09R42W	2009 RW42	2.20	0.07	6.00	329.1	98.4	0.6	2.17	1.18	1.49	18.29±0.16	4	56	20.38±0.12	3.65±0.04	0.45	2
K09SW6J	2009 SJ326	2.36	0.23	6.42	117.8	291.0	0.8	2.07	1.13	10.62	17.37±0.14	4	70	19.86±0.10	5.11±0.05	0.52	2
K09U72L		2.40	0.24	1.84	122.5	294.7	0.8	2.02	1.07	9.71	17.47±0.29	2	48	19.75±0.09	5.52±0.03	1.21	3
K09V65T	2009 VT65	2.40	0.18	2.10	323.1	116.7	0.5	2.03	1.06	7.40	18.70±0.24	4	28	20.89±0.18	3.10±0.03	0.89	2
K09W09Q		2.38	0.27	4.48	112.3	262.9	0.6	2.33	1.37	6.69	18.01±0.26	4	16	21.02±0.17	5.52±0.23	0.81	2
K09W72H		2.40	0.18	2.25	106.6	317.4	0.8	2.10	1.14	7.83	17.55±0.14	4	58	19.96±0.10	5.27±0.09	0.49	2
K1023	(201023) 2002 CZ264	2.55	0.21	2.19	313.3	7.0	2.4	3.07	2.09	2.23	16.13±0.18	4	52	20.41±0.12	9.90±0.20	0.63	2
K10A21D		2.56	0.12	2.15	293.3	168.0	1.6	2.25	1.31	9.23	17.01±0.18	1	18	19.93±0.11	6.15±0.96	0.57	2
K10C56H	2010 CH56	2.59	0.12	12.94	301.7	245.9	1.9	2.45	1.49	6.95	16.27±0.19	4	70	19.66±0.08	7.38±0.11	0.55	3
K10C94Q	2010 CQ94	2.57	0.02	6.83	152.0	19.1	1.2	2.53	1.54	0.46	17.57±0.14	4	52	20.63±0.13	10.55±0.36	0.48	2
K10J39O		3.13	0.08	19.26	118.8	307.0	4.6	2.97	2.05	7.76	15.54±0.31	4	51	19.98±0.11	9.06±0.08	1.09	3
K10M51F	2010 MF51	2.63	0.10	17.76	150.6	41.8	1.9	2.42	1.43	0.78	16.32±0.19	4	73	19.13±0.06	4.32±0.02	0.57	3
K11O23Y		3.10	0.06	15.93	305.7	346.9	5.2	3.29	2.35	6.38	15.18±0.14	2	40	20.05±0.12	7.93±0.19	0.58	2
K1236	(201236) 2002 RG24	2.79	0.03	1.53	273.4	29.8	2.4	2.87	1.89	2.95	16.12±0.13	2	37	19.96±0.10	4.87±0.14	0.33	2
K12S42P		2.70	0.09	3.66	301.4	74.1	2.2	2.73	1.79	6.91	16.30±0.19	2	36	20.23±0.12	7.16±0.11	0.73	2
K12T44K	2012 TK44	2.45	0.07	6.22	310.1	205.5	0.7	2.27	1.29	4.10	17.75±0.16	4	39	20.48±0.13	3.36±0.04	0.54	2
K12TO5K	2012 TK245	2.75	0.17	9.28	153.0	250.5	1.6	2.79	1.81	2.90	16.92±0.28	4	26	20.77±0.16	2.42±0.04	0.99	2
K12TU5D	2012 TD305	3.18	0.17	6.66	157.0	251.1	3.4	3.15	2.18	3.95	16.13±0.14	4	49	20.67±0.13	8.89±0.17	0.49	3
K13B03N	2013 BN3	5.15	0.03	10.24	152.5	261.3	10.5	5.16	4.18	1.07	13.65±0.15	3	42	20.46±0.13	2.98±0.05	0.54	2
K13X08V	2013 XV8	1.35	0.19	4.04	107.3	15.1	0.1	1.09	0.12	20.52	21.61±0.13	3	31	18.15±0.02	3.89±0.06	0.09	2
K13Y06A	2013 YA6	2.82	0.05	4.70	100.2	151.4	3.0	2.92	1.95	3.88	16.37±0.13	4	40	20.43±0.12	3.49±0.05	0.48	2
K13Y08O	2013 YO8	2.78	0.16	2.79	122.7	55.0	1.6	2.53	1.56	4.15	16.94±0.21	4	46	20.26±0.14	7.06±0.15	0.77	2
K13Y09O	2013 YO9	2.67	0.16	7.07	118.8	300.6	1.6	2.36	1.39	4.74	17.01±0.17	4	58	19.98±0.12	5.55±0.06	0.67	3
K13Y14V	2013 YV14	1.92	0.06	17.06	289.0	269.8	0.4	1.90	0.93	6.61	18.76±0.22	3	45	20.44±0.14	6.53±0.18	0.81	2

Table 2—Continued

Obj ID	Designation	a	e	i	Ω	ω	D	Δ	r	α	H_R	n	m	PTF_R	Period (hr)	Δm	U
K13Y16S	2013 YS16	3.10	0.07	12.65	122.4	54.5	4.4	2.97	2.01	5.19	15.55 \pm 0.20	3	44	19.78 \pm 0.11	5.45 \pm 0.06	0.70	3
K13Y39R	2013 YR39	2.73	0.08	10.75	121.5	201.5	2.0	2.91	1.96	6.18	16.45 \pm 0.26	4	26	20.69 \pm 0.17	3.90 \pm 0.08	0.79	2
K13Y42H	2013 YH42	2.69	0.15	10.38	298.3	274.3	2.5	2.67	1.71	5.40	16.06 \pm 0.18	4	62	19.76 \pm 0.10	4.23 \pm 0.04	0.49	2
K13Y48Z	2013 YZ48	2.31	0.16	23.58	109.5	319.3	0.8	2.00	1.03	4.14	17.50 \pm 0.16	2	52	19.32 \pm 0.06	4.75 \pm 0.05	0.58	2
K13Y49A	2013 YA49	3.10	0.18	17.92	112.9	341.1	3.2	2.55	1.57	3.62	16.21 \pm 0.12	3	58	19.53 \pm 0.09	3.68 \pm 0.04	0.37	2
K13Y62H		2.35	0.16	9.92	114.8	79.7	1.1	2.22	1.25	5.98	16.89 \pm 0.14	4	72	19.77 \pm 0.10	2.29 \pm 0.04	0.43	2
K13Y62M	2013 YM62	2.66	0.13	10.63	293.1	223.0	1.8	2.38	1.42	6.66	16.71 \pm 0.13	4	64	19.78 \pm 0.10	8.57 \pm 0.24	0.42	2
K13Y62R	2013 YR62	2.44	0.13	1.64	155.4	305.5	0.6	2.12	1.15	6.58	17.95 \pm 0.27	3	44	20.34 \pm 0.14	6.27 \pm 0.08	0.86	2
K13Y73R	2013 YR73	2.60	0.16	3.76	84.7	351.3	1.7	2.26	1.32	8.43	16.84 \pm 0.16	4	65	19.77 \pm 0.10	3.87 \pm 0.03	0.38	2
K13Y76H	2013 YH76	3.12	0.13	27.26	295.5	203.7	3.2	2.73	1.77	5.76	16.24 \pm 0.14	4	56	20.08 \pm 0.12	3.29 \pm 0.05	0.41	2
K13Y78D	2013 YD78	3.17	0.16	13.78	296.3	178.1	3.1	2.65	1.69	6.00	16.32 \pm 0.13	4	61	20.04 \pm 0.11	7.74 \pm 0.18	0.40	2
K13Y78J	2013 YJ78	3.17	0.04	10.19	122.5	3.8	3.3	3.04	2.08	4.91	16.17 \pm 0.19	4	35	20.54 \pm 0.15	6.04 \pm 0.24	0.56	2
K13Y82V	2013 YV82	2.32	0.18	4.85	289.5	175.2	0.5	1.92	0.94	5.71	18.34 \pm 0.21	4	68	19.94 \pm 0.12	8.21 \pm 0.22	0.61	3
K13YB1E	2013 YE111	2.40	0.14	3.15	91.1	92.5	0.8	2.20	1.29	12.79	17.45 \pm 0.21	3	34	20.42 \pm 0.14	3.87 \pm 0.03	0.60	2
K13YB5U	2013 YU115	2.36	0.18	7.46	112.9	350.9	0.4	1.95	1.01	11.41	18.83 \pm 0.21	4	35	21.00 \pm 0.17	3.57 \pm 0.04	0.73	2
K13YC8L	2013 YL128	3.13	0.12	5.74	299.4	262.4	3.7	3.06	2.09	4.45	15.90 \pm 0.24	4	40	20.44 \pm 0.14	6.44 \pm 0.09	0.84	2
K13YD9Q	2013 YQ139	2.75	0.15	6.95	304.8	182.5	2.0	2.34	1.38	7.08	16.50 \pm 0.27	4	74	19.57 \pm 0.07	5.93 \pm 0.04	0.89	3
K13YE0B	2013 YB140	2.34	0.14	2.12	113.4	352.4	0.6	2.03	1.06	6.26	18.29 \pm 0.21	4	52	20.31 \pm 0.14	5.61 \pm 0.10	0.81	2
K13YE7Y	2013 YY147	2.35	0.12	3.41	104.9	100.4	0.8	2.32	1.36	5.96	17.58 \pm 0.16	4	40	20.53 \pm 0.14	5.39 \pm 0.09	0.53	2
K14A05O	2014 AO5	2.59	0.15	6.02	108.4	10.8	1.2	2.20	1.22	5.15	17.58 \pm 0.24	2	47	20.15 \pm 0.11	5.33 \pm 0.06	0.84	2
K14A19L	2014 AL19	1.95	0.11	17.47	299.7	85.2	0.7	1.93	0.98	9.24	17.84 \pm 0.24	3	57	20.04 \pm 0.10	5.65 \pm 0.03	0.86	3
K14A42N	2014 AN42	2.61	0.18	3.52	277.0	245.5	1.5	2.25	1.28	5.05	17.11 \pm 0.16	4	64	19.83 \pm 0.10	7.80 \pm 0.26	0.42	2
K14A42R	2014 AR42	2.69	0.14	10.86	116.1	336.0	1.5	2.35	1.38	5.96	17.12 \pm 0.30	4	61	20.10 \pm 0.13	7.56 \pm 0.12	1.15	2
K14A49V	2014 AV49	2.28	0.11	5.75	288.7	334.9	0.9	2.48	1.51	5.96	17.20 \pm 0.15	4	42	20.48 \pm 0.14	3.23 \pm 0.03	0.48	2
K14A53F	2014 AF53	2.40	0.11	6.13	120.8	356.2	0.7	2.14	1.16	4.87	17.65 \pm 0.24	4	62	20.04 \pm 0.11	5.36 \pm 0.03	0.72	3
K14B29S	2014 BS29	2.36	0.13	1.14	342.6	184.1	0.8	2.06	1.08	2.77	17.63 \pm 0.15	4	73	19.63 \pm 0.07	4.97 \pm 0.03	0.46	2
K14B37G	2014 BG37	2.25	0.16	6.30	143.2	4.7	0.6	1.89	0.90	2.41	18.24 \pm 0.17	4	73	19.63 \pm 0.08	4.95 \pm 0.03	0.51	3
K14B38L	2014 BL38	2.40	0.11	2.36	141.3	49.8	0.8	2.17	1.18	2.68	17.57 \pm 0.28	4	69	19.78 \pm 0.09	5.11 \pm 0.03	0.89	3
K14B47B	2014 BB47	2.21	0.12	6.16	148.3	327.9	0.6	1.99	1.00	2.68	18.07 \pm 0.25	4	72	19.83 \pm 0.09	7.74 \pm 0.06	0.81	3
K14B47D	2014 BD47	2.57	0.20	4.76	317.7	162.9	1.2	2.10	1.11	1.59	17.69 \pm 0.23	4	72	19.84 \pm 0.09	5.78 \pm 0.04	0.65	2
K14B62Q ^b	2014 BQ62	2.55	0.04	14.76	342.9	214.8	1.8	2.46	1.47	1.94	16.79 \pm 0.23	3	55	19.81 \pm 0.09	8.35 \pm 0.07	0.71	3
K14C02U	2014 CU2	3.17	0.14	27.98	334.3	162.4	4.7	2.75	1.76	0.65	15.39 \pm 0.15	4	76	18.91 \pm 0.05	4.21 \pm 0.02	0.35	3

Table 2—Continued

Obj ID	Designation	a	e	i	Ω	ω	D	Δ	r	α	H_R	n	m	PTF_R	Period (hr)	Δm	U
K14C22D	2014 CD22	2.70	0.18	14.57	150.6	1.8	1.6	2.20	1.22	2.96	16.94±0.18	2	45	19.51±0.06	4.00±0.05	0.37	2
K14D01A	2014 DA1	3.15	0.13	3.97	311.2	224.8	3.3	2.77	1.79	2.33	16.16±0.08	4	63	19.77±0.08	3.71±0.04	0.24	2
K14D01C	2014 DC1	2.69	0.12	9.78	326.5	130.1	1.5	2.46	1.48	3.32	17.11±0.14	4	53	20.18±0.11	4.03±0.05	0.41	2
K14D01O	2014 DO1	2.79	0.29	9.29	148.6	30.9	1.2	2.04	1.06	3.84	17.61±0.27	2	20	19.54±0.08	5.27±0.09	0.88	2
K14D01V	2014 DV1	3.11	0.21	10.60	149.5	329.6	2.8	2.54	1.55	0.61	16.49±0.13	3	55	19.59±0.07	3.95±0.03	0.45	2
K14D08Z	2014 DZ8	2.67	0.03	13.56	330.3	347.1	2.1	2.76	1.77	0.65	16.37±0.11	4	65	19.97±0.09	5.03±0.05	0.37	2
K14D10P	2014 DP10	2.55	0.03	21.97	334.4	98.4	1.8	2.54	1.55	0.96	16.69±0.22	4	68	19.82±0.09	6.81±0.05	0.70	3
K14D10V	2014 DV10	2.00	0.02	18.80	339.6	241.1	0.7	1.98	1.00	1.86	17.94±0.18	2	45	19.65±0.08	5.33±0.06	0.54	3
K1556	(201556) 2003 RZ18	2.71	0.19	2.93	166.0	243.2	2.9	2.75	1.76	0.67	15.72±0.23	4	69	19.26±0.06	6.81±0.05	0.80	2
K1581	(201581) 2003 SS80	2.67	0.23	12.29	290.9	15.8	3.4	3.27	2.31	4.26	15.37±0.17	3	45	20.16±0.13	9.41±0.38	0.55	2
K1689	(201689) 2003 UO116	2.79	0.07	3.40	132.8	326.2	2.9	2.60	1.62	3.17	15.71±0.16	4	62	19.12±0.06	5.75±0.11	0.26	2
K1719	(201719) 2003 UD189	2.71	0.12	3.08	277.5	85.0	3.2	2.97	1.98	2.34	15.58±0.25	4	64	19.75±0.09	13.33±0.18	0.89	2
K1758	(201758) 2003 WC26	2.73	0.05	3.55	86.6	187.7	2.5	2.85	1.90	5.74	16.05±0.19	4	54	20.15±0.12	8.50±0.23	0.68	2
K2264	(202264) 2005 AB61	2.69	0.06	6.27	305.3	227.4	4.1	2.55	1.58	4.56	15.72±0.08	3	57	19.11±0.05	6.76±0.25	0.15	2
K2521	(202521) 2006 BP274	2.55	0.16	2.48	123.3	278.0	1.3	2.62	1.64	1.41	17.47±0.21	4	37	20.75±0.15	3.31±0.02	0.78	2
K2640	(202640) 2006 JW13	2.62	0.10	3.08	209.2	178.7	2.7	2.73	1.75	3.88	15.82±0.10	4	68	19.58±0.08	2.49±0.01	0.31	2
K2858	(202858) 2008 TW117	2.70	0.12	1.72	298.6	195.2	2.7	2.39	1.41	3.23	16.23±0.26	2	32	19.18±0.05	5.78±0.14	0.80	3
K3047	(203047) 2000 EC52	2.83	0.05	1.94	175.9	165.3	2.9	2.97	1.99	3.07	16.43±0.17	4	32	20.57±0.16	2.70±0.02	0.54	2
K3254	(203254) 2001 QG129	3.09	0.21	9.90	296.2	85.2	6.5	2.96	1.99	2.97	15.17±0.24	4	72	19.27±0.06	5.85±0.04	0.62	3
K3712	(203712) 2002 PF159	2.78	0.04	0.63	62.0	222.7	3.5	2.87	1.95	8.12	16.24±0.19	4	35	20.52±0.17	2.59±0.01	0.76	2
K3738	(203738) 2002 QB88	2.90	0.15	0.73	294.7	102.2	3.2	2.72	1.75	2.85	16.21±0.10	3	50	19.87±0.10	2.57±0.03	0.43	2
K3742	(203742) 2002 QH111	2.77	0.05	11.98	150.6	244.5	3.3	2.83	1.84	1.52	16.01±0.12	4	75	19.67±0.09	4.10±0.04	0.32	2
K3996	(203996) 2003 TX16	2.67	0.10	2.68	319.0	24.5	2.7	2.94	1.95	0.69	15.85±0.14	4	62	19.82±0.10	2.87±0.02	0.42	2
K4193	(204193) 2004 BB90	2.98	0.09	11.47	303.6	203.2	4.8	2.72	1.79	8.28	15.34±0.11	4	64	19.35±0.06	2.73±0.02	0.25	2
K4203	(204203) 2004 CT5	2.96	0.12	2.10	103.5	23.4	3.8	2.61	1.65	5.14	15.52±0.14	4	72	19.11±0.05	3.42±0.02	0.18	2
K4214	(204214) 2004 CW58	2.98	0.22	15.85	120.1	136.3	6.9	3.39	2.43	4.69	14.74±0.27	4	60	19.80±0.10	8.07±0.07	0.81	3
K4504	(204504) 2005 CR45	2.75	0.19	2.61	69.4	54.4	1.4	2.24	1.33	12.50	17.21±0.27	3	40	20.36±0.12	5.36±0.06	0.76	2
K4529	(204529) 2005 EF90	2.79	0.06	2.20	266.5	0.1	2.6	2.87	1.90	4.25	15.97±0.18	2	39	20.06±0.10	5.49±0.16	0.58	2
K4565	(204565) 2005 EF290	2.83	0.01	2.73	141.8	117.3	3.8	2.84	1.85	0.54	15.89±0.09	3	56	19.56±0.08	2.74±0.04	0.23	2
K4831	(204831) Levski	2.79	0.08	7.49	124.7	241.9	2.4	2.84	1.86	3.20	16.11±0.18	4	57	20.00±0.11	2.59±0.04	0.44	2
K6237	(206237) 2002 WG15	3.05	0.21	9.18	107.2	340.0	4.5	2.47	1.50	4.70	15.50±0.05	2	38	18.71±0.04	3.38±0.02	0.19	3
K6240	(206240) 2002 WC27	2.98	0.04	1.57	2.6	192.0	3.5	2.95	2.00	6.71	16.06±0.17	4	51	20.44±0.13	8.07±0.26	0.74	2

Table 2—Continued

Obj ID	Designation	a	e	i	Ω	ω	D	Δ	r	α	H_R	n	m	PTF_R	Period (hr)	Δm	U
K6245	(206245) 2002 XU17	3.05	0.15	2.40	73.2	11.7	4.2	2.63	1.67	5.68	15.63±0.17	1	24	19.26±0.05	5.08±0.20	0.54	2
K6877	(206877) 2004 FF139	3.13	0.05	2.91	58.6	209.5	4.3	3.26	2.31	5.69	15.59±0.16	3	49	20.41±0.13	3.65±0.04	0.43	2
K7637	(207637) 2006 TE24	2.99	0.15	2.74	336.3	331.1	4.5	3.39	2.40	0.22	15.51±0.13	3	50	20.16±0.09	5.75±0.14	0.41	2
K7690	(207690) 2007 RE19	2.86	0.07	1.92	178.5	218.9	3.0	2.93	1.94	1.94	16.41±0.15	4	45	20.43±0.15	8.35±0.28	0.59	2
K7758	(207758) 2007 SN19	2.87	0.03	2.41	158.3	288.6	3.5	2.83	1.84	0.68	16.07±0.17	2	44	19.78±0.08	4.16±0.04	0.48	3
K7932	(207932) 2008 YW16	2.90	0.03	3.78	108.8	296.5	3.7	2.87	1.96	8.54	15.95±0.16	4	60	20.27±0.12	10.67±0.37	0.47	2
K8190	(208190) 2000 QY193	3.08	0.11	11.96	157.5	172.4	4.7	3.41	2.44	3.49	15.40±0.20	3	42	20.33±0.12	3.68±0.03	0.64	3
K8398	(208398) 2001 SD200	3.11	0.17	1.44	53.3	16.2	4.2	2.71	1.74	4.78	15.66±0.16	4	58	19.49±0.08	9.23±0.18	0.41	2
K8420	(208420) 2001 SQ324	3.06	0.08	9.48	293.9	135.0	4.5	2.88	1.92	5.12	15.48±0.11	4	51	19.61±0.09	2.32±0.03	0.26	2
K8422	(208422) 2001 SE340	2.88	0.23	15.30	329.2	314.4	4.6	3.24	2.25	1.35	15.95±0.23	4	38	20.45±0.15	6.96±0.10	0.76	2
K8993	(208993) 2003 AZ69	3.12	0.26	0.24	72.1	50.4	3.1	2.30	1.34	8.21	16.32±0.15	4	76	19.31±0.07	7.68±0.12	0.35	3
K9026	(209026) 2003 FQ21	3.16	0.16	4.75	160.6	279.2	3.8	2.89	1.92	4.25	15.86±0.10	4	63	19.88±0.09	7.22±0.11	0.30	2
K9428	(209428) 2004 FR50	3.04	0.12	11.54	157.8	125.6	3.3	3.29	2.31	2.70	15.34±0.19	4	46	20.01±0.10	4.73±0.05	0.61	3
K9824	(209824) 2005 GP133	2.85	0.09	4.67	158.4	317.9	3.3	2.61	1.64	4.85	15.91±0.23	1	17	19.40±0.09	5.93±0.47	0.82	2
L0145	(210145) 2006 SG57	3.03	0.01	11.41	338.9	208.5	5.1	3.00	2.01	0.80	15.22±0.19	4	76	19.13±0.06	11.03±0.13	0.54	3
L0258	(210258) 2007 RW285	3.05	0.10	2.01	146.2	245.2	3.4	2.98	2.01	4.07	16.13±0.20	4	53	20.37±0.13	8.81±0.24	0.71	2
L0278	(210278) 2007 TJ29	2.99	0.20	1.16	187.2	261.6	3.0	2.62	1.63	1.81	16.39±0.11	4	66	19.70±0.09	5.22±0.06	0.36	2
L0317	(210317) 2007 TM217	3.02	0.03	2.84	343.4	143.6	4.1	2.92	1.97	5.58	15.86±0.16	3	58	20.11±0.12	2.81±0.03	0.40	2
L0474	(210474) 1995 ST58	3.08	0.04	1.88	308.8	150.6	3.4	3.00	2.02	2.58	16.09±0.15	4	44	20.15±0.12	3.33±0.02	0.54	2
L1439	(211439) 2002 YD23	3.04	0.28	0.45	267.6	161.4	2.9	2.71	1.72	1.01	16.45±0.13	4	72	19.84±0.09	12.97±0.36	0.51	2
L2672	(212672) 2006 UP332	3.11	0.04	10.31	152.5	84.4	3.9	3.10	2.12	2.55	15.82±0.17	4	60	20.12±0.11	4.12±0.05	0.55	2
L2791	(212791) 2007 TN232	2.98	0.13	1.67	56.2	34.2	3.4	2.76	1.77	1.03	16.12±0.12	4	65	19.64±0.08	10.21±0.21	0.41	2
L2930	(212930) 2008 BX6	3.25	0.11	5.71	150.2	156.7	4.7	3.58	2.60	2.35	15.38±0.14	4	50	20.47±0.13	3.12±0.02	0.50	2
L2933	(212933) 2008 DQ8	3.16	0.12	1.99	59.1	195.4	3.5	3.17	2.18	1.28	16.06±0.17	4	49	20.44±0.12	11.57±0.59	0.50	2
L6428	(216428) Mauricio	2.72	0.15	3.32	149.6	291.1	1.9	2.54	1.55	0.47	16.63±0.14	4	67	19.66±0.08	3.95±0.03	0.35	2
L7236	(217236) 2003 FQ78	2.46	0.17	1.75	297.0	309.6	1.3	2.65	1.71	7.55	16.40±0.25	4	41	20.21±0.13	5.71±0.07	0.76	3
L7258	(217258) 2003 WE41	2.20	0.13	2.01	306.8	119.3	0.7	1.99	1.02	6.47	17.64±0.12	4	71	19.64±0.09	4.36±0.06	0.33	2
L7888	(217888) 2001 RA94	2.44	0.20	0.62	351.8	29.9	1.1	2.38	1.42	6.93	16.79±0.15	4	110	19.93±0.10	3.44±0.02	0.44	2
L9032	(219032) 1995 EM3	2.17	0.11	2.01	290.6	329.1	0.8	2.36	1.38	4.31	17.62±0.33	4	22	20.68±0.18	5.82±0.11	1.27	2
L9167	(219167) 1999 TH54	2.23	0.12	3.90	5.5	43.6	1.0	2.27	1.28	1.88	16.95±0.10	4	77	19.49±0.08	3.29±0.02	0.26	2
M0026	(220026) 2002 QG55	2.28	0.18	2.62	331.9	57.7	1.0	2.19	1.24	8.22	17.10±0.24	4	65	19.83±0.09	8.00±0.13	0.71	3
M1994	(221994) 1997 PT4	2.42	0.23	3.05	285.5	92.6	1.3	2.68	1.70	3.71	16.36±0.21	4	63	20.03±0.09	5.71±0.03	0.71	3

Table 2—Continued

Obj ID	Designation	a	e	i	Ω	ω	D	Δ	r	α	H_R	n	m	PTF_R	Period (hr)	Δm	U
M2658	(222658) 2001 XJ194	2.52	0.22	2.84	127.1	281.5	2.3	2.22	1.26	7.92	16.21±0.16	4	71	19.01±0.05	5.89±0.11	0.21	2
M2965	(222965) 2002 QJ45	2.19	0.16	1.79	174.7	111.5	1.0	2.43	1.44	3.41	16.99±0.18	4	71	20.02±0.11	8.21±0.22	0.65	2
M3120	(223120) 2002 VZ32	2.34	0.22	0.99	246.6	121.2	0.9	2.35	1.37	3.34	17.32±0.15	4	54	20.16±0.13	2.44±0.02	0.39	2
M3170	(223170) 2002 YP7	2.38	0.28	5.81	109.3	322.6	1.0	1.83	0.86	8.35	17.03±0.21	4	95	18.55±0.04	8.35±0.07	0.60	3
M3193	(223193) 2003 AX71	2.34	0.21	1.59	239.4	167.7	0.9	2.36	1.37	2.09	17.34±0.25	2	40	20.06±0.09	4.68±0.05	0.91	2
M3512	(223512) 2004 CA43	2.27	0.05	1.94	69.5	137.1	1.0	2.26	1.31	8.03	16.97±0.24	4	65	19.85±0.09	4.97±0.05	0.63	3
M3521	(223521) 2004 CZ100	2.25	0.05	7.18	340.7	134.8	1.3	2.15	1.17	2.67	16.47±0.15	4	76	18.74±0.04	3.17±0.01	0.35	2
M4074	(224074) 2005 NJ53	2.26	0.11	6.54	145.0	311.3	0.9	2.10	1.11	1.18	17.19±0.23	4	73	19.16±0.06	6.44±0.04	0.70	3
M5415	(225415) 1999 XA261	2.28	0.14	2.35	87.9	51.9	0.9	1.97	1.02	9.77	17.32±0.13	4	72	19.27±0.07	2.96±0.03	0.31	2
M6193	(226193) 2002 TY285	2.26	0.23	3.36	330.5	24.1	1.3	2.74	1.75	0.76	16.39±0.22	4	59	20.07±0.12	6.19±0.08	0.69	2
M6311	(226311) 2003 CX7	2.41	0.17	3.20	103.6	357.0	1.1	2.00	1.03	7.12	16.82±0.24	4	78	18.95±0.05	6.49±0.04	0.71	3
M6604	(226604) 2004 CC86	2.27	0.13	2.16	136.0	121.0	1.0	2.49	1.53	5.80	17.03±0.15	4	54	20.37±0.14	3.56±0.05	0.49	2
M6682	(226682) 2004 HP43	2.29	0.15	0.19	243.6	301.9	0.9	2.12	1.17	8.72	17.34±0.23	4	61	19.99±0.10	4.47±0.02	0.77	3
M7189	(227189) 2005 QS67	2.35	0.17	2.82	18.3	67.9	0.7	2.15	1.16	2.45	17.65±0.18	4	68	19.69±0.09	4.17±0.04	0.47	2
M7234	(227234) 2005 SR5	2.35	0.18	1.73	252.0	69.6	1.1	2.71	1.73	3.64	16.75±0.14	2	36	20.43±0.14	2.27±0.03	0.57	2
M7837	(227837) 2007 CX56	2.36	0.17	3.14	113.8	30.8	1.2	2.01	1.04	5.32	16.62±0.23	4	77	18.68±0.04	5.71±0.03	0.68	3
M7839	(227839) 2007 CC73	2.29	0.20	2.00	347.4	60.6	0.6	2.31	1.32	2.07	17.99±0.16	2	31	20.63±0.15	2.41±0.02	0.56	2
M8821	(228821) 2003 BV57	2.38	0.15	1.55	321.4	166.5	0.9	2.03	1.08	9.60	17.14±0.27	4	68	19.43±0.07	8.21±0.07	0.90	3
M8830	(228830) 2003 DP	2.38	0.15	1.82	268.8	177.0	1.1	2.17	1.19	3.73	16.79±0.23	4	65	19.21±0.06	4.30±0.02	0.64	3
M9062	(229062) 2004 GB24	2.33	0.12	5.42	99.8	161.8	1.0	2.53	1.59	7.99	16.95±0.15	4	43	20.54±0.15	2.46±0.03	0.52	2
M9468	(229468) 2005 UE253	2.44	0.16	1.07	359.6	82.9	0.9	2.11	1.16	9.66	17.32±0.22	4	55	19.88±0.10	4.97±0.03	0.76	2
N0162	(230162) 2001 QE244	2.38	0.13	6.33	167.2	191.6	1.2	2.64	1.65	2.38	16.55±0.17	4	63	19.94±0.10	5.78±0.07	0.47	2
N0224	(230224) 2001 TS160	2.41	0.13	0.67	321.2	216.7	0.9	2.12	1.14	1.19	17.33±0.21	4	65	19.62±0.08	4.82±0.02	0.57	2
N1336 ^b	(231336) 2006 DL197	2.58	0.22	9.98	290.4	239.9	1.6	2.20	1.22	3.42	16.49±0.27	4	69	18.93±0.05	9.23±0.09	0.78	3
N1865	(231865) 2000 SY318	2.60	0.29	11.44	315.1	104.2	3.5	2.34	1.36	5.82	15.29±0.14	4	77	18.22±0.03	3.02±0.01	0.34	3
N2206*	(232206) 2002 GN107	2.56	0.20	12.14	160.8	74.1	1.7	2.44	1.47	4.71	16.45±0.21	4	61	19.64±0.08	11.29±0.13	0.77	3
N2486	(232486) 2003 NN	2.60	0.21	7.93	158.5	195.9	2.8	3.09	2.10	0.56	15.76±0.19	4	68	19.87±0.09	3.86±0.03	0.62	2
N2775	(232775) 2004 PA75	2.35	0.21	4.92	344.1	284.8	1.0	2.44	1.46	1.98	16.97±0.11	4	63	19.99±0.11	2.31±0.01	0.39	2
N3214	(233214) 2005 XT110	2.64	0.14	1.92	2.0	16.1	1.7	2.67	1.74	8.52	16.88±0.18	3	27	20.78±0.17	4.19±0.06	0.59	2
N3350 ^b	(233350) 2006 DT61	2.64	0.22	13.24	158.3	73.8	2.3	2.47	1.49	4.42	15.42±0.25	4	75	18.73±0.04	5.33±0.03	0.71	3
N3378	(233378) 2006 DP199	2.55	0.12	15.84	149.4	14.4	2.3	2.26	1.27	0.98	16.18±0.19	4	80	18.60±0.04	5.52±0.03	0.54	3
N3486	(233486) 2006 UF1	3.11	0.01	8.24	292.0	67.7	6.4	3.12	2.16	4.07	15.26±0.16	4	68	19.73±0.09	12.63±0.34	0.50	2

Table 2—Continued

Obj ID	Designation	a	e	i	Ω	ω	D	Δ	r	α	H_R	n	m	PTF_R	Period (hr)	Δm	U
N3557	(233557) 2007 NA5	2.72	0.15	4.42	102.2	218.6	2.7	3.08	2.10	2.93	15.88±0.13	4	59	20.20±0.13	5.61±0.13	0.48	2
N3760	(233760) 2008 TT55	2.63	0.16	1.24	216.4	246.8	1.7	2.29	1.30	4.33	16.87±0.13	4	72	19.51±0.08	2.79±0.02	0.30	2
N3874	(233874) 2008 WL59	2.67	0.07	3.49	109.8	298.2	2.2	2.61	1.69	9.43	16.31±0.23	4	54	20.12±0.10	8.14±0.20	0.85	2
N3904	(233904) 2009 BA128	3.11	0.02	11.99	122.4	82.1	6.0	3.11	2.14	2.59	15.07±0.17	4	70	19.32±0.07	2.83±0.02	0.40	3
N3929	(233929) 2009 UN83	2.32	0.21	1.91	189.1	205.1	0.7	2.41	1.43	4.27	17.73±0.18	4	39	20.76±0.17	4.85±0.05	0.73	2
N3963	(233963) 2010 AP31	2.59	0.17	5.42	127.5	12.0	1.7	2.19	1.22	5.30	16.83±0.07	2	51	19.35±0.07	5.25±0.08	0.25	2
N4311	(234311) 2001 AL53	2.68	0.14	11.11	303.2	187.4	4.2	2.31	1.36	8.94	15.55±0.10	4	72	18.60±0.04	6.15±0.08	0.31	3
N4314	(234314) 2001 BY30	2.66	0.20	6.18	317.5	169.4	2.4	2.14	1.22	12.38	16.08±0.16	4	70	18.87±0.05	3.37±0.01	0.33	3
N4631	(234631) 2002 CL11	2.53	0.12	5.10	318.7	227.0	1.6	2.37	1.44	10.66	16.99±0.15	4	56	20.31±0.12	6.11±0.11	0.42	2
N4696	(234696) 2002 GW129	2.56	0.09	1.16	39.8	195.1	1.7	2.51	1.52	1.34	16.88±0.20	4	65	19.93±0.10	5.55±0.03	0.58	3
N4761	(234761) Rainerkracht	2.68	0.15	6.41	155.1	104.0	1.9	2.74	1.76	1.10	16.02±0.11	4	74	19.64±0.08	7.44±0.11	0.26	2
N4795	(234795) 2002 QR61	2.84	0.07	1.33	330.5	357.4	3.1	3.00	2.03	4.06	16.32±0.25	4	39	20.59±0.14	9.41±0.29	0.82	2
N5132	(235132) 2003 QP57	2.54	0.17	8.75	141.2	115.0	2.4	2.56	1.57	1.32	16.35±0.18	4	76	19.43±0.07	4.75±0.02	0.50	3
N5263*	(235263) 2003 SN428	2.68	0.07	1.47	287.1	301.6	3.4	2.74	1.77	5.02	16.45±0.26	2	43	20.20±0.11	5.65±0.07	0.97	2
N5323	(235323) 2003 UU181	2.76	0.07	1.25	235.3	137.3	1.8	2.79	1.83	5.25	16.74±0.21	4	34	20.71±0.16	4.92±0.10	0.77	2
N5661 ^b	(235661) 2004 RB221	2.58	0.13	12.55	330.7	107.6	3.1	2.45	1.46	0.96	15.56±0.22	4	83	18.40±0.03	5.16±0.03	0.64	3
N5841	(235841) 2004 YC12	2.71	0.07	4.02	305.5	153.7	2.6	2.52	1.58	8.04	16.43±0.20	4	62	19.94±0.11	9.32±0.18	0.62	2
N5882	(235882) 2005 CM5	2.79	0.19	2.26	120.3	358.5	2.4	2.25	1.28	2.79	16.44±0.15	2	45	18.98±0.05	8.73±0.16	0.58	2
N6432	(236432) 2006 DF132	2.61	0.03	4.03	100.3	98.7	2.2	2.60	1.63	5.07	16.27±0.16	4	59	19.96±0.11	3.27±0.03	0.46	2
N6472	(236472) 2006 FS14	2.61	0.02	4.17	168.4	359.4	2.6	2.56	1.57	1.64	16.84±0.16	4	62	20.09±0.10	6.04±0.04	0.54	3
N6473	(236473) 2006 FO18	2.65	0.20	2.10	171.7	248.6	3.5	2.55	1.56	1.17	16.40±0.23	4	75	19.56±0.07	12.63±0.16	0.73	2
N6672	(236672) 2006 PK35	3.04	0.11	14.57	118.4	224.0	4.0	3.23	2.25	2.74	15.48±0.19	4	57	20.03±0.11	11.85±0.42	0.60	2
N7181	(237181) 2008 UX184	2.53	0.13	1.03	265.5	21.0	1.4	2.75	1.76	2.43	17.22±0.14	4	55	20.84±0.15	4.44±0.06	0.51	2
N7266	(237266) 2008 WX96	2.72	0.14	4.19	99.7	275.0	2.2	2.80	1.88	8.86	16.26±0.19	4	51	20.42±0.13	3.71±0.04	0.54	2
N7777 ^b	(237777) 2002 AH114	2.52	0.16	2.32	311.2	102.9	1.8	2.30	1.36	9.42	16.78±0.24	4	56	19.96±0.10	10.79±0.12	0.87	2
N7921	(237921) 2002 PF173	2.80	0.08	3.74	212.4	177.4	3.4	2.89	1.91	4.15	15.93±0.16	3	40	20.01±0.09	3.81±0.05	0.52	2
N8535	(238535) 2004 TQ334	2.57	0.18	1.10	109.4	324.1	1.2	2.21	1.27	9.62	17.57±0.26	4	39	20.42±0.13	6.53±0.09	0.87	2
N8636	(238636) 2005 CF55	2.70	0.02	3.07	8.1	135.2	1.7	2.64	1.65	2.46	16.85±0.27	2	42	20.37±0.11	8.73±0.16	0.76	3
N8650	(238650) 2005 EV44	2.78	0.05	4.90	171.8	332.5	3.2	2.62	1.64	2.90	16.21±0.17	4	58	19.72±0.08	9.06±0.17	0.54	2
N9035	(239035) 2006 DZ145	2.56	0.17	2.98	359.9	334.5	2.0	3.00	2.01	1.08	16.49±0.15	2	41	20.37±0.12	3.21±0.04	0.45	2
N9036	(239036) 2006 DS147	2.58	0.14	2.34	189.9	73.1	2.3	2.69	1.71	3.70	17.00±0.14	4	67	20.65±0.14	4.21±0.09	0.53	2
N9101	(239101) 2006 HN53	2.61	0.13	3.27	151.8	59.0	2.2	2.42	1.43	3.07	17.18±0.24	4	60	20.12±0.13	10.21±0.21	0.79	2

Table 2—Continued

Obj ID	Designation	a	e	i	Ω	ω	D	Δ	r	α	H_R	n	m	PTF_R	Period (hr)	Δm	U
N9152	(239152) 2006 KD9	2.78	0.05	1.81	84.5	346.2	3.0	2.66	1.69	4.30	16.28±0.20	4	62	20.03±0.10	4.23±0.06	0.63	2
N9392	(239392) 2007 TG20	2.79	0.08	2.02	236.6	86.4	2.7	3.00	2.02	4.15	15.86±0.14	4	57	20.16±0.12	5.75±0.03	0.55	3
N9440	(239440) 2007 TR171	2.83	0.05	2.82	134.0	265.4	4.1	2.87	1.88	1.68	15.68±0.24	3	66	19.59±0.08	5.58±0.03	0.69	3
N9673	(239673) 2008 YV22	2.86	0.06	1.12	246.2	173.6	3.0	2.84	1.86	3.50	16.35±0.18	4	58	20.22±0.13	4.68±0.05	0.61	2
O0486	(240486) 2004 BU156	2.96	0.07	6.78	117.5	152.9	3.6	3.14	2.18	5.08	15.96±0.10	2	42	20.54±0.13	3.53±0.09	0.40	2
O0558	(240558) 2004 RU250	2.62	0.23	2.66	335.8	81.5	1.7	2.23	1.28	9.10	16.81±0.25	4	65	19.69±0.09	5.93±0.04	0.70	3
O0765	(240765) 2005 MX12	3.12	0.14	28.42	121.3	144.0	5.2	3.44	2.50	5.56	15.17±0.20	4	45	20.26±0.13	9.06±0.17	0.58	2
O1216	(241216) 2007 TM63	3.07	0.11	1.57	112.8	336.8	3.9	2.74	1.76	2.63	15.79±0.18	4	63	19.48±0.08	9.80±0.20	0.50	2
O1221	(241221) 2007 TO80	2.95	0.12	3.40	101.1	255.6	3.7	3.07	2.10	3.67	15.93±0.20	2	34	20.28±0.12	5.45±0.09	0.67	2
O1607	(241607) 1999 RJ201	2.70	0.20	10.29	310.4	81.6	3.9	2.55	1.60	7.16	16.16±0.21	4	75	19.72±0.08	5.82±0.10	0.51	2
O2070	(242070) 2002 TP130	2.30	0.16	3.86	311.8	95.6	1.3	2.13	1.20	11.26	16.75±0.15	4	70	19.22±0.06	3.64±0.04	0.30	2
O2365	(242365) 2004 CM27	2.98	0.18	2.56	118.8	3.8	3.9	2.45	1.47	4.42	15.81±0.22	4	87	19.08±0.07	10.00±0.11	0.52	3
O2366	(242366) 2004 CP29	2.87	0.01	3.00	131.0	102.4	3.0	2.87	1.88	0.75	16.38±0.13	4	64	20.15±0.11	4.07±0.03	0.45	2
O2395	(242395) 2004 FU43	2.97	0.09	6.84	111.7	61.9	4.4	2.80	1.87	8.09	15.74±0.27	4	64	19.87±0.09	7.68±0.06	0.84	3
O2846	(242846) 2006 EE39	2.56	0.26	9.88	310.4	278.8	3.1	2.32	1.34	5.03	16.40±0.11	4	74	19.18±0.06	3.50±0.03	0.29	2
O2995	(242995) 2006 TS8	3.13	0.08	6.49	121.7	6.1	4.0	2.89	1.92	5.08	15.77±0.15	4	63	19.91±0.11	10.43±0.33	0.33	2
O3200	(243200) 2007 TC447	2.87	0.05	2.86	142.5	172.4	3.1	2.99	2.00	1.76	16.28±0.22	4	78	20.34±0.12	6.36±0.09	0.72	3
O5355	(245355) 2005 EL263	2.79	0.07	1.87	318.9	353.4	3.2	2.96	1.97	0.53	16.52±0.23	4	60	20.35±0.14	3.98±0.03	0.73	3
O5408	(245408) 2005 JO	2.92	0.06	3.30	184.4	165.6	3.4	3.07	2.09	3.15	16.46±0.14	3	22	20.82±0.17	4.82±0.28	0.43	2
O6696	(246696) 2009 AN25	2.94	0.07	1.71	283.5	259.1	3.1	2.86	1.89	3.99	16.33±0.20	4	48	20.34±0.15	7.06±0.21	0.72	2
O8896	(248896) 2006 UE270	3.12	0.17	2.19	217.8	16.8	3.5	3.00	2.02	2.72	15.85±0.17	4	51	20.03±0.11	8.50±0.15	0.55	2
Q6931	(266931) 2010 JZ119	3.10	0.09	9.52	160.6	206.0	3.9	3.29	2.31	3.10	15.82±0.12	3	39	20.61±0.12	6.08±0.28	0.36	2
Q7024	(267024) 1995 XK3	2.27	0.19	4.07	143.9	182.0	1.1	2.70	1.71	0.66	16.77±0.17	4	45	20.17±0.14	5.25±0.06	0.68	2
Q9189	(269189) 2008 GZ50	2.14	0.07	4.53	173.1	20.4	0.6	2.04	1.07	7.02	18.23±0.18	3	30	20.40±0.14	4.71±0.12	0.62	2
R0928	(270928) 2002 UD37	2.33	0.21	2.48	347.1	60.3	0.8	2.08	1.12	9.11	17.39±0.16	4	64	19.87±0.10	2.46±0.01	0.35	2
R1445	(271445) 2004 EC12	2.24	0.11	7.03	156.0	27.5	1.2	2.04	1.06	3.95	16.68±0.24	4	73	18.75±0.04	7.62±0.06	0.77	3
R1713	(271713) 2004 RU200	2.63	0.30	5.31	292.8	64.4	2.7	2.77	1.80	3.96	15.85±0.21	4	75	19.75±0.10	4.19±0.04	0.65	2
R2214	(272214) 2005 QD42	2.30	0.15	7.05	342.0	14.7	1.2	2.61	1.62	0.94	16.61±0.18	4	66	19.74±0.10	11.03±0.37	0.58	2
R2294	(272294) 2005 SA21	2.31	0.17	5.38	155.0	168.8	1.0	2.71	1.73	2.77	17.04±0.14	4	37	20.69±0.16	3.21±0.03	0.43	2
R4198	(274198) 2008 HY22	2.18	0.18	5.14	0.0	342.0	0.8	2.56	1.57	1.91	17.37±0.23	3	37	20.62±0.14	5.61±0.13	0.70	2
R4231	(274231) 2008 KJ40	2.23	0.13	5.14	102.0	133.8	1.0	2.33	1.38	8.34	16.97±0.26	4	51	20.02±0.12	4.68±0.05	0.87	2
R4881	(274881) 2009 SE25	2.22	0.13	4.37	328.2	81.2	0.7	2.23	1.24	3.89	17.82±0.13	4	57	20.35±0.13	4.55±0.06	0.37	2

Table 2—Continued

Obj ID	Designation	a	e	i	Ω	ω	D	Δ	r	α	H_R	n	m	PTF_R	Period (hr)	Δm	U
R5955	(275955) 2001 VY68	2.42	0.19	1.72	1.5	13.9	1.2	2.69	1.71	0.77	16.59±0.18	2	24	19.95±0.12	6.86±0.14	0.51	2
R5971	(275971) 2001 WS91	2.48	0.26	5.31	306.4	81.0	1.1	2.31	1.35	6.79	16.73±0.31	4	68	19.67±0.09	5.03±0.03	0.96	3
R6738 ^b	(276738) 2004 ET42	2.27	0.14	1.88	8.0	129.8	0.9	1.96	1.05	14.60	17.28±0.26	1	26	19.63±0.07	4.95±0.16	0.93	2
R6760	(276760) 2004 GA19	2.30	0.11	11.47	117.2	96.6	1.0	2.29	1.35	9.31	17.06±0.24	4	51	20.15±0.12	6.58±0.13	0.73	2
R7192	(277192) 2005 QS35	2.33	0.15	6.29	145.4	241.9	0.9	2.49	1.50	0.98	17.17±0.21	4	58	20.19±0.12	8.00±0.14	0.81	2
R7293	(277293) 2005 SN106	2.39	0.14	1.39	8.6	100.6	0.8	2.07	1.10	6.98	17.47±0.13	4	69	19.76±0.08	4.64±0.07	0.40	2
R8112	(278112) 2007 CK	2.27	0.14	5.30	140.7	356.9	0.7	1.96	0.97	1.61	17.66±0.11	4	76	19.13±0.06	3.98±0.05	0.18	2
R8184	(278184) 2007 DR98	2.36	0.14	1.91	133.6	92.4	0.7	2.44	1.47	6.05	17.74±0.21	3	23	20.93±0.18	5.08±0.08	0.84	2
R8889	(278889) 2008 TC88	2.67	0.22	3.50	85.7	291.1	2.7	2.67	1.72	6.91	15.86±0.27	4	66	19.95±0.10	13.15±0.18	0.71	2
R9652	(279652) 2011 FJ4	2.22	0.16	2.86	156.6	105.0	0.8	2.31	1.33	3.54	17.53±0.19	4	67	20.22±0.12	5.22±0.06	0.55	2
S0009	(280009) 2001 VM6	2.42	0.09	0.96	5.4	31.8	1.0	2.49	1.50	1.41	16.99±0.13	3	38	20.04±0.11	3.76±0.24	0.29	2
S0084	(280084) 2002 CZ295	2.53	0.24	8.37	335.8	349.2	2.7	3.12	2.13	0.91	15.85±0.12	4	62	20.10±0.12	7.80±0.12	0.39	2
S0308	(280308) 2003 QP58	2.72	0.13	5.86	125.4	257.0	2.1	2.69	1.73	4.93	16.39±0.14	4	60	20.12±0.12	2.23±0.02	0.44	2
S0781 ^b	(280781) 2005 SO129	2.39	0.17	3.63	204.2	220.5	1.1	2.27	1.29	5.55	16.88±0.20	2	40	19.65±0.08	5.05±0.03	0.66	3
S1012	(281012) 2006 EA11	2.59	0.16	5.78	151.2	240.2	1.8	2.72	1.74	3.14	16.69±0.15	4	56	20.36±0.11	2.36±0.02	0.43	2
S1026	(281026) 2006 GU4	2.71	0.11	4.33	102.3	264.4	2.2	2.76	1.78	2.87	16.34±0.16	3	54	20.04±0.11	4.27±0.07	0.46	2
S1122	(281122) 2007 BW57	2.36	0.13	2.16	109.3	56.7	1.0	2.16	1.18	3.64	17.11±0.35	3	44	19.53±0.09	6.76±0.05	0.98	3
S1981	(281981) 2011 HJ12	2.61	0.10	6.79	117.4	173.9	2.4	2.87	1.89	2.51	16.12±0.28	4	58	20.06±0.12	9.23±0.17	0.89	2
S2077	(282077) 2000 ER142	2.31	0.13	7.79	150.4	42.5	0.6	2.08	1.10	4.43	18.10±0.26	3	49	20.19±0.09	10.79±0.24	0.77	3
S2705	(282705) 2006 BD96	2.55	0.04	12.19	156.3	206.7	2.2	2.63	1.65	1.63	16.34±0.12	4	67	19.74±0.09	2.68±0.02	0.32	2
S3057	(283057) Casteldipiazza	2.29	0.22	7.80	140.6	168.1	0.9	2.73	1.74	1.21	17.13±0.25	2	15	20.68±0.16	3.92±0.31	0.84	2
S3252	(283252) 2011 EL53	2.43	0.12	7.56	114.1	198.2	1.3	2.72	1.77	6.32	16.48±0.21	3	34	20.39±0.14	8.28±0.28	0.68	2
S3633	(283633) 2002 EG5	2.54	0.08	2.50	8.1	220.2	1.5	2.47	1.48	1.38	17.06±0.27	4	68	20.11±0.12	5.30±0.03	0.95	2
S3764	(283764) 2003 GW8	2.43	0.17	3.85	197.0	20.8	1.1	2.23	1.25	5.50	16.87±0.12	4	63	19.50±0.08	4.29±0.04	0.40	2
S4772	(284772) 2008 WM121	2.96	0.10	7.61	309.1	89.8	4.9	3.03	2.05	2.82	15.32±0.14	4	64	19.57±0.08	6.00±0.08	0.39	2
S4925	(284925) 2010 CY103	2.59	0.07	3.46	127.6	85.7	1.7	2.49	1.50	1.17	16.83±0.21	4	68	19.69±0.09	5.68±0.03	0.70	3
S4970	(284970) 2010 FP100	2.72	0.09	5.30	156.7	130.2	1.9	2.89	1.91	3.14	16.58±0.13	2	37	20.62±0.15	2.56±0.03	0.43	2
S6096	(286096) 2001 TR47	3.01	0.08	10.49	156.2	177.2	4.1	3.26	2.27	0.55	15.71±0.18	4	60	20.22±0.11	11.03±0.25	0.62	2
S6322	(286322) 2001 WD83	3.16	0.07	3.02	77.5	9.7	4.0	2.99	2.10	9.45	15.74±0.25	4	56	20.46±0.14	3.14±0.01	0.76	2
S6340	(286340) 2001 XS43	3.17	0.11	10.44	324.4	79.2	5.3	3.22	2.24	1.99	15.13±0.11	4	71	19.68±0.08	5.61±0.07	0.26	2
S7471	(287471) 2003 AK46	3.03	0.08	9.10	322.3	260.9	5.0	2.95	1.97	3.78	15.29±0.16	2	27	19.32±0.06	2.75±0.05	0.33	2
S9114	(289114) 2004 TK346	2.63	0.19	1.62	298.4	106.8	1.3	2.37	1.40	4.20	17.47±0.20	4	45	20.49±0.15	3.81±0.06	0.63	2

Table 2—Continued

Obj ID	Designation	a	e	i	Ω	ω	D	Δ	r	α	H_R	n	m	PTF_R	Period (hr)	Δm	U
S9931	(289931) 2005 NW32	3.10	0.05	8.77	167.9	128.9	4.7	3.23	2.25	3.06	15.39 \pm 0.22	4	58	20.05 \pm 0.12	4.66 \pm 0.02	0.83	3
T1447	(291447) 2006 DH40	2.57	0.14	12.55	296.8	215.0	2.3	2.27	1.31	6.84	16.23 \pm 0.26	2	34	19.11 \pm 0.06	14.12 \pm 0.21	0.89	2
T2019	(292019) 2006 QP149	2.99	0.06	4.81	140.3	41.7	3.4	2.84	1.85	1.50	16.12 \pm 0.18	4	68	19.85 \pm 0.10	4.68 \pm 0.05	0.57	3
T3404	(293404) 2007 EN79	2.39	0.17	1.28	299.1	324.6	0.9	2.52	1.54	4.23	17.31 \pm 0.17	4	50	20.53 \pm 0.16	2.67 \pm 0.02	0.50	2
T3628	(293628) 2007 NE1	2.58	0.11	13.92	108.8	128.1	2.6	2.69	1.73	5.97	15.94 \pm 0.31	1	23	19.73 \pm 0.09	7.01 \pm 0.61	1.15	3
T5704	(295704) 2008 TZ189	2.67	0.18	3.99	315.3	59.1	2.0	2.94	1.96	3.09	16.54 \pm 0.29	2	27	20.68 \pm 0.14	5.27 \pm 0.09	0.96	2
T6089	(296089) 2009 BK17	3.05	0.06	11.26	116.8	113.9	4.4	3.13	2.16	3.13	15.55 \pm 0.21	4	60	20.03 \pm 0.11	12.97 \pm 0.34	0.75	2
T6119	(296119) 2009 BU64	2.86	0.08	14.41	329.3	181.2	4.3	2.64	1.65	1.88	15.58 \pm 0.12	3	47	18.99 \pm 0.05	3.90 \pm 0.03	0.24	2
T6886	(296886) 2010 AF79	2.45	0.06	6.66	321.5	168.7	1.0	2.30	1.32	2.10	16.96 \pm 0.22	4	72	19.51 \pm 0.08	9.70 \pm 0.10	0.69	3
T6984	(296984) 2010 ER105	2.63	0.18	5.19	145.9	35.2	1.8	2.20	1.21	1.60	16.73 \pm 0.19	4	81	19.13 \pm 0.06	4.97 \pm 0.03	0.53	3
T8312	(298312) 2003 EE18	3.22	0.12	6.37	117.1	92.0	4.6	3.19	2.22	4.12	15.44 \pm 0.21	4	44	20.03 \pm 0.11	5.08 \pm 0.05	0.71	2
T9209	(299209) 2005 JN36	2.88	0.24	15.83	148.0	116.6	2.6	3.02	2.03	1.81	16.71 \pm 0.19	4	40	20.87 \pm 0.17	2.91 \pm 0.03	0.71	2
T9484	(299484) 2006 BX182	3.99	0.28	11.80	143.5	268.1	6.6	3.92	2.94	0.90	14.66 \pm 0.19	4	65	20.10 \pm 0.11	8.28 \pm 0.14	0.71	2
T9832	(299832) 2006 SB188	3.07	0.01	6.64	171.9	254.4	3.5	3.06	2.09	3.60	16.01 \pm 0.14	4	48	20.39 \pm 0.12	5.65 \pm 0.07	0.43	2
U0059	(300059) 2006 UV186	3.04	0.10	16.27	331.9	14.5	4.5	3.33	2.35	0.49	15.51 \pm 0.20	4	69	20.09 \pm 0.12	6.23 \pm 0.04	0.77	3
U0139	(300139) 2006 VU58	3.06	0.05	2.88	350.3	216.8	3.3	2.96	1.97	1.08	16.16 \pm 0.19	4	62	20.18 \pm 0.11	6.44 \pm 0.04	0.60	3
U0798	(300798) 2007 VV331	3.15	0.10	2.12	314.8	234.0	3.3	2.87	1.89	1.06	16.14 \pm 0.23	3	48	19.95 \pm 0.09	6.58 \pm 0.04	0.70	3
V7640	(317640) 2003 ER23	2.41	0.13	2.06	113.6	76.8	0.9	2.27	1.33	8.94	17.13 \pm 0.22	4	55	20.11 \pm 0.13	7.16 \pm 0.11	0.80	2
V9034	(319034) 2005 VZ49	2.37	0.05	4.12	323.0	164.2	1.0	2.26	1.28	4.54	17.04 \pm 0.12	2	29	19.74 \pm 0.09	2.88 \pm 0.05	0.39	2
W0292	(320292) 2007 RO221	2.77	0.08	2.81	214.5	94.4	1.8	2.97	1.99	3.23	16.69 \pm 0.25	3	20	20.83 \pm 0.17	1.57 \pm 0.02	0.97	2
W0399	(320399) 2007 UY105	3.11	0.15	4.71	121.3	53.5	4.1	2.82	1.86	5.18	15.67 \pm 0.19	4	64	19.69 \pm 0.09	16.00 \pm 0.52	0.47	2
W1184	(321184) 2008 WM114	2.75	0.05	2.42	279.4	155.7	2.1	2.64	1.68	5.92	16.41 \pm 0.21	4	58	20.10 \pm 0.12	4.49 \pm 0.06	0.61	2
W1515	(321515) 2009 SK201	2.32	0.11	2.44	150.1	272.3	0.6	2.14	1.16	3.77	17.97 \pm 0.21	4	49	20.27 \pm 0.13	14.12 \pm 0.78	0.61	2
W1659	(321659) 2010 CS20	2.69	0.06	3.90	118.8	188.4	2.0	2.85	1.87	3.56	16.53 \pm 0.13	4	40	20.45 \pm 0.15	4.34 \pm 0.46	0.53	2
X2696	(332696) 2009 RM19	2.21	0.18	2.78	330.2	66.4	0.6	2.32	1.33	1.64	18.04 \pm 0.09	3	37	20.67 \pm 0.14	3.97 \pm 83.31	0.32	2
X2847	(332847) 2010 FA30	2.72	0.09	2.55	125.1	306.0	2.3	2.68	1.69	1.11	16.21 \pm 0.22	4	73	19.65 \pm 0.09	8.35 \pm 0.07	0.71	3
X3322	(333322) 2001 QG26	2.40	0.23	2.77	156.1	220.2	1.0	2.68	1.70	3.16	16.99 \pm 0.29	4	56	20.56 \pm 0.13	7.74 \pm 0.12	1.06	3
X3356	(333356) 2001 UK188	2.44	0.22	3.81	171.2	216.1	0.9	2.59	1.62	4.92	17.19 \pm 0.13	4	39	20.70 \pm 0.15	3.13 \pm 0.03	0.47	2
X3406	(333406) 2002 TW375	2.29	0.18	3.91	359.5	36.2	0.8	2.42	1.43	1.36	17.59 \pm 0.16	4	52	20.37 \pm 0.14	2.84 \pm 0.02	0.56	2
X3887	(333887) 1998 RX50	2.31	0.12	6.87	343.7	28.6	1.1	2.52	1.53	1.57	16.80 \pm 0.13	4	69	19.91 \pm 0.10	3.38 \pm 0.02	0.33	2
X4033	(334033) 2000 YT113	2.65	0.22	12.86	303.1	151.0	1.8	2.10	1.15	8.62	16.74 \pm 0.25	4	77	19.23 \pm 0.06	16.27 \pm 0.27	0.71	3
X4150	(334150) 2001 RA129	2.38	0.12	7.07	153.4	236.0	1.1	2.52	1.53	1.57	16.77 \pm 0.20	4	64	19.97 \pm 0.11	5.27 \pm 0.06	0.51	2

Table 2—Continued

Obj ID	Designation	a	e	i	Ω	ω	D	Δ	r	α	H_R	n	m	PTF_R	Period (hr)	Δm	U
X4202	(334202) 2001 SS291	2.38	0.27	12.25	151.3	185.2	1.3	3.01	2.02	2.68	16.45±0.16	4	29	20.60±0.15	3.75±0.04	0.70	2
X4206	(334206) 2001 SL304	3.13	0.17	1.03	202.2	218.5	3.4	2.77	1.81	4.42	16.07±0.27	4	58	20.00±0.12	12.97±0.34	0.91	2
X4293	(334293) 2001 UX202	2.45	0.15	2.01	334.3	97.0	0.8	2.16	1.20	6.74	17.44±0.21	4	59	20.08±0.10	6.32±0.08	0.80	3
X4904	(334904) 2003 WL167	2.79	0.23	9.57	157.1	250.5	1.9	2.73	1.76	4.30	16.67±0.15	3	40	20.44±0.14	1.59±0.01	0.58	2
X5110	(335110) 2004 TE168	2.56	0.17	2.99	139.3	290.1	1.7	2.45	1.46	0.91	16.87±0.14	4	76	19.78±0.10	3.84±0.03	0.45	2
X5179	(335179) 2005 AD77	2.71	0.19	16.94	321.5	93.6	2.3	2.62	1.64	4.41	16.23±0.11	4	81	19.64±0.08	2.44±0.01	0.31	2
X5433	(335433) 2005 UW163	2.39	0.15	1.62	290.3	183.5	0.6	2.10	1.11	1.43	17.77±0.17	4	69	19.77±0.10	1.29±0.00	0.51	2
X5445	(335445) 2005 UV354	2.44	0.11	6.65	284.7	157.1	1.1	2.19	1.21	2.74	16.86±0.17	4	66	19.34±0.08	6.27±0.04	0.68	3
X5742 ^b	(335742) 2007 EW11	2.35	0.17	3.11	127.9	17.9	0.9	2.00	1.02	4.81	17.31±0.28	4	71	19.37±0.06	5.78±0.04	0.96	3
X5748	(335748) 2007 EH44	2.35	0.17	1.74	229.5	227.9	0.7	2.07	1.09	3.38	17.66±0.20	4	63	19.78±0.08	6.11±0.04	0.64	2
X7226	(337226) 2000 EL98	2.30	0.02	8.29	150.4	9.3	0.8	2.24	1.25	1.54	17.53±0.20	4	67	20.05±0.10	1.87±0.01	0.53	2
X7680	(337680) 2001 TR209	3.06	0.12	2.88	13.3	53.8	2.5	2.99	2.01	0.99	16.75±0.09	4	34	20.68±0.15	4.97±0.22	0.34	2
X7990	(337990) 2002 CR253	2.53	0.08	6.20	109.8	60.7	1.9	2.41	1.43	4.09	16.60±0.13	4	62	19.64±0.09	5.55±0.10	0.38	2
X8103	(338103) 2002 PV197	2.79	0.01	5.46	280.9	42.3	1.9	2.81	1.84	3.98	16.60±0.19	4	39	20.51±0.16	7.74±0.68	0.77	2
X8155	(338155) 2002 QU146	2.83	0.04	3.20	103.9	343.8	3.1	2.72	1.75	4.28	16.34±0.17	4	55	20.12±0.12	3.00±0.04	0.53	2
X8237	(338237) 2002 TS98	2.90	0.18	0.98	329.2	76.8	3.5	2.97	1.98	0.41	16.04±0.21	4	52	20.05±0.11	5.33±0.03	0.72	3
X8288	(338288) 2002 UG13	2.97	0.24	9.33	155.5	255.1	3.9	2.85	1.88	4.28	15.81±0.14	4	69	19.79±0.10	9.90±0.10	0.50	3
X8603	(338603) 2003 ST180	2.70	0.08	7.30	164.6	247.6	2.4	2.70	1.72	3.15	16.15±0.11	4	51	19.85±0.09	2.92±0.02	0.31	2
X9330	(339330) 2004 XH174	2.70	0.07	10.41	311.6	108.2	1.9	2.60	1.65	7.54	16.66±0.27	4	48	20.35±0.13	10.79±0.38	0.93	2
X9449	(339449) 2005 ER189	2.80	0.11	7.73	159.9	266.5	3.3	2.70	1.73	5.23	16.17±0.16	4	64	19.89±0.10	5.61±0.06	0.45	2
X9450	(339450) 2005 ED193	2.77	0.09	3.31	337.5	87.2	1.8	2.74	1.75	0.79	16.79±0.15	4	52	20.33±0.13	3.71±0.03	0.54	2
X9662	(339662) 2005 QD84	2.32	0.05	3.30	337.5	107.1	0.9	2.26	1.28	2.30	17.29±0.13	4	73	19.89±0.09	7.68±0.12	0.31	2
X9663	(339663) 2005 QR85	2.33	0.16	4.14	335.9	19.0	1.0	2.67	1.68	0.54	16.98±0.17	4	69	20.28±0.12	7.33±0.17	0.48	2
X9771	(339771) 2005 SL112	2.28	0.14	6.40	309.0	0.3	1.1	2.57	1.58	2.95	16.89±0.20	4	48	20.28±0.12	4.95±0.05	0.71	3
Y0005	(340005) 2005 UJ311	2.29	0.18	3.19	338.0	338.5	1.1	2.69	1.70	1.28	16.90±0.25	4	37	20.38±0.15	7.38±0.11	0.95	2
Y0256	(340256) 2006 BW139	2.45	0.14	6.43	340.5	38.6	1.0	2.66	1.67	0.50	16.91±0.18	2	39	20.20±0.12	11.71±0.29	0.50	2
Y0341	(340341) 2006 DP55	2.62	0.16	16.55	295.1	299.6	2.6	2.76	1.80	4.60	15.96±0.23	4	97	19.81±0.10	7.68±0.06	0.79	3
Y0355	(340355) 2006 DM91	2.57	0.13	2.35	144.6	318.4	1.3	2.31	1.33	2.34	17.39±0.20	3	40	20.05±0.10	6.76±0.05	0.75	3
Y0513 ^b	(340513) 2006 JC15	2.64	0.21	3.07	51.3	6.7	2.1	2.60	1.62	2.17	16.44±0.25	2	46	19.78±0.07	7.50±0.06	0.72	3
Y0658	(340658) 2006 RA17	3.13	0.18	26.27	340.5	54.6	4.7	3.33	2.35	1.43	15.39±0.21	3	57	20.03±0.11	8.50±0.23	0.64	2
Y1163	(341163) 2007 PM49	2.59	0.09	13.64	151.5	50.6	1.8	2.44	1.47	5.36	16.75±0.19	4	64	19.96±0.10	5.42±0.03	0.74	3
Y1187	(341187) 2007 RZ47	2.81	0.08	0.49	131.7	263.7	2.4	2.90	1.91	0.92	16.87±0.33	2	22	20.72±0.18	3.28±0.03	1.42	2

Table 2—Continued

Obj ID	Designation	a	e	i	Ω	ω	D	Δ	r	α	H_R	n	m	PTF_R	Period (hr)	Δm	U
Y1343	(341343) 2007 TD45	2.92	0.13	4.15	192.5	275.4	2.8	2.61	1.63	4.02	16.55±0.20	3	49	20.05±0.11	7.22±0.11	0.78	3
Y1556	(341556) 2007 UX23	3.04	0.09	3.12	125.3	292.6	3.6	2.88	1.92	4.90	15.99±0.16	4	58	20.18±0.14	2.67±0.03	0.46	2
Y1799	(341799) 2007 XF23	3.14	0.17	1.99	136.5	287.7	3.6	2.75	1.77	3.41	15.98±0.17	3	44	19.89±0.10	3.60±0.07	0.47	2
Y2266	(342266) 2008 SS309	2.61	0.22	1.92	256.9	119.3	1.8	2.93	1.94	2.42	16.75±0.22	2	25	20.74±0.14	2.07±0.01	0.79	2
Y2659	(342659) 2008 VP4	2.65	0.11	4.31	297.0	92.4	2.0	2.60	1.63	4.58	16.52±0.20	4	66	20.02±0.11	6.91±0.10	0.76	2
Y3106	(343106) 2009 DT69	3.09	0.07	1.14	340.6	130.5	3.4	2.89	1.94	6.71	16.11±0.17	4	56	20.33±0.14	5.19±0.09	0.49	2
Y3113	(343113) 2009 DB128	3.08	0.13	5.79	316.6	117.2	3.5	2.80	1.87	8.24	16.03±0.26	4	53	20.19±0.14	5.85±0.07	0.65	2
Y3764	(343764) 2011 FO126	2.22	0.11	2.87	280.2	276.5	0.7	2.16	1.19	6.54	17.73±0.12	2	38	20.27±0.13	7.68±0.41	0.42	2
Y4450	(344450) 2002 JJ120	2.62	0.10	13.83	113.3	111.3	2.2	2.67	1.72	6.36	16.30±0.24	4	54	20.09±0.11	5.96±0.08	0.76	3
Y4461	(344461) 2002 NK56	2.76	0.11	7.81	287.9	340.8	2.2	3.03	2.06	3.19	16.25±0.19	2	40	20.43±0.13	8.35±0.35	0.64	2
Y4597	(344597) 2003 DW3	2.38	0.10	7.45	343.0	224.8	1.0	2.23	1.24	1.05	17.04±0.18	3	56	19.24±0.06	10.79±0.24	0.42	3
Y4683	(344683) 2003 SP263	2.69	0.08	5.31	168.0	224.7	2.0	2.78	1.79	1.84	16.54±0.23	4	46	20.25±0.12	6.00±0.04	0.80	2
Y4927	(344927) 2004 TU62	3.99	0.19	1.73	251.3	174.5	4.7	3.41	2.43	2.10	15.39±0.27	4	35	20.38±0.15	2.82±0.02	0.71	2
Y5120	(345120) 2005 QR73	2.38	0.21	3.59	292.7	55.5	1.0	2.58	1.60	3.60	17.11±0.18	2	35	20.46±0.14	7.33±0.22	0.58	2
Y6352	(346352) 2008 RM118	2.40	0.14	2.20	352.1	252.7	0.8	2.35	1.36	1.67	17.38±0.20	4	77	20.13±0.11	1.22±0.00	0.63	2
Y6641	(346641) 2008 XD12	2.67	0.07	5.23	149.0	357.3	1.5	2.47	1.49	3.10	17.19±0.23	3	44	20.33±0.13	3.60±0.05	0.77	2
Y6653	(346653) 2008 XC55	2.69	0.04	5.35	285.0	64.8	2.4	2.78	1.81	4.47	16.06±0.16	4	52	19.96±0.10	3.60±0.04	0.52	2
Y6759	(346759) 2009 BV46	3.02	0.06	9.00	311.1	169.4	3.6	2.82	1.90	8.82	16.00±0.23	4	47	20.26±0.12	4.85±0.07	0.80	2
Y6802	(346802) 2009 BZ177	3.01	0.14	4.62	177.1	282.5	2.6	2.71	1.72	2.42	16.64±0.17	4	57	20.29±0.12	5.85±0.11	0.63	2
Y6816	(346816) 2009 CV51	2.99	0.14	3.02	135.3	340.4	2.5	2.56	1.60	5.97	16.73±0.15	4	60	20.22±0.12	5.11±0.11	0.33	2
Y7461	(347461) 2012 TW302	2.66	0.09	6.07	171.2	226.7	1.7	2.72	1.75	3.62	16.85±0.13	4	41	20.59±0.14	3.09±0.04	0.45	2
Y8084	(348084) 2003 WO94	2.80	0.07	3.19	280.0	121.4	3.1	2.73	1.76	4.00	16.34±0.28	4	52	20.07±0.14	8.65±0.16	0.95	2
Y8431	(348431) 2005 QL7	2.23	0.15	3.92	353.2	303.9	1.0	2.46	1.47	2.56	17.07±0.20	4	53	20.17±0.12	4.53±0.02	0.53	2
Y9115	(349115) 2007 GR36	2.38	0.14	2.25	119.3	139.1	0.7	2.40	1.41	2.59	17.64±0.22	4	46	20.52±0.12	5.16±0.06	0.77	3
Y9243	(349243) 2007 TB105	2.77	0.11	3.08	334.2	15.8	2.1	3.05	2.06	0.74	16.36±0.28	4	42	20.56±0.14	6.36±0.09	0.78	2
Y9509	(349509) 2008 QR5	2.37	0.20	2.74	152.8	160.5	0.8	2.80	1.81	0.23	17.50±0.15	2	24	21.10±0.18	6.67±0.29	0.60	2
Y9880	(349880) 2009 DD84	3.02	0.05	5.96	141.3	223.3	3.7	3.16	2.17	0.71	15.94±0.24	4	58	20.22±0.12	5.89±0.07	0.79	3
Z3253	(353253) 2010 EQ42	2.61	0.15	6.50	111.7	332.4	2.1	2.28	1.36	10.94	16.43±0.12	3	60	19.51±0.08	8.89±0.32	0.28	2
a5456	(365456) 2010 NX66	3.15	0.13	17.87	111.4	242.4	5.1	3.33	2.37	3.90	15.22±0.15	4	60	20.11±0.12	4.47±0.06	0.47	2
a6221	(366221) 2012 TH232	2.64	0.04	4.83	125.4	187.0	2.2	2.74	1.79	6.42	16.26±0.16	4	64	20.17±0.13	3.61±0.03	0.61	2
b6842	(376842) 2001 QM259	2.28	0.29	23.48	337.8	281.3	1.1	2.26	1.27	1.62	16.75±0.18	4	83	19.18±0.06	5.19±0.03	0.48	3
c0406	(380406) 2002 YG19	2.34	0.17	1.76	288.9	164.3	0.8	2.07	1.09	4.15	17.56±0.18	4	53	19.55±0.08	3.40±0.04	0.41	2

Table 2—Continued

Obj ID	Designation	a	e	i	Ω	ω	D	Δ	r	α	H_R	n	m	PTF_R	Period (hr)	Δm	U
c2261	(382261) 2012 TQ94	3.10	0.03	10.66	291.5	211.3	4.3	3.01	2.04	3.31	15.58±0.14	4	66	19.79±0.09	7.22±0.11	0.44	2
c2583	(382583) 2002 CQ166	2.54	0.18	7.05	111.6	49.3	1.3	2.18	1.22	6.58	17.51±0.16	4	59	20.09±0.12	2.21±0.03	0.36	2
c2774	(382774) 2003 SD77	2.71	0.15	10.12	320.0	84.0	2.1	2.76	1.77	2.31	16.41±0.25	3	38	20.03±0.10	4.73±0.02	0.71	2
c3039	(383039) 2005 QJ18	2.39	0.20	1.92	132.9	244.5	0.7	2.37	1.41	6.50	17.68±0.18	4	40	20.77±0.15	3.27±0.05	0.66	2
c3097	(383097) 2005 SS136	2.37	0.14	3.11	175.0	269.9	0.7	2.17	1.19	5.99	17.82±0.18	4	54	20.36±0.13	5.65±0.07	0.54	3
c3135	(383135) 2005 UJ44	2.44	0.16	2.28	137.5	288.7	0.7	2.15	1.18	4.66	17.79±0.22	4	50	20.20±0.12	10.55±0.23	0.62	2
c3455	(383455) 2006 XU17	2.27	0.20	3.75	315.4	136.2	0.9	1.98	0.99	3.32	17.26±0.25	4	69	19.07±0.05	18.82±0.36	0.64	3
c3521	(383521) 2007 CV55	2.32	0.20	2.24	142.7	271.8	0.5	2.02	1.05	6.50	18.39±0.16	4	45	20.49±0.15	4.97±0.11	0.56	2
c3609	(383609) 2007 JJ20	2.40	0.14	2.48	174.0	333.5	0.6	2.06	1.08	3.18	17.96±0.18	2	20	19.96±0.12	2.43±0.03	0.56	2
c3814	(383814) 2008 BE19	3.15	0.09	8.75	321.2	118.4	3.8	3.02	2.04	2.05	15.87±0.25	4	59	20.12±0.10	7.11±0.05	0.78	3
c4358	(384358) 2009 UL72	2.40	0.24	1.84	122.5	294.7	0.9	2.02	1.06	8.54	17.22±0.35	2	23	19.62±0.10	5.61±0.10	0.79	2
c4400	(384400) 2009 WG43	2.42	0.22	7.71	113.4	328.6	0.8	1.96	1.03	13.07	17.42±0.18	4	67	19.72±0.09	6.15±0.08	0.54	2
c4460	(384460) 2010 BC5	2.57	0.31	7.51	107.8	294.1	1.7	2.13	1.16	6.87	16.85±0.15	4	76	19.30±0.06	7.38±0.06	0.42	3
c4508	(384508) 2010 CU123	2.60	0.24	4.17	285.5	153.1	1.5	2.05	1.08	6.93	17.14±0.16	4	62	19.37±0.08	11.85±0.30	0.35	2
c4547	(384547) 2010 EH79	2.63	0.05	9.61	159.9	96.9	1.8	2.67	1.69	2.90	16.75±0.24	4	53	20.21±0.12	5.05±0.05	0.87	2
c4655	(384655) 2011 FG11	2.22	0.09	2.01	326.3	194.7	0.7	2.07	1.13	11.45	17.88±0.15	1	21	20.38±0.13	2.82±0.26	0.47	2
c4997	(384997) 2012 TG218	2.41	0.12	0.80	290.3	238.3	0.8	2.13	1.14	1.38	17.45±0.11	4	74	19.57±0.07	7.33±0.16	0.26	3
c5104	(385104) 2012 VL80	2.75	0.08	10.29	149.4	186.6	1.8	2.97	1.99	2.44	16.72±0.19	3	23	20.80±0.16	3.02±0.03	0.69	2
c5529	(385529) 2004 PT7	2.37	0.22	12.67	154.9	133.8	1.1	2.69	1.70	1.35	16.86±0.22	3	41	20.41±0.13	7.62±0.18	0.75	2
c5545	(385545) 2004 RS237	2.58	0.25	2.68	313.2	116.6	1.4	2.28	1.30	4.56	17.26±0.34	2	27	20.02±0.11	5.52±0.06	0.96	3
c5613	(385613) 2005 GP91	2.88	0.21	8.17	351.2	356.2	4.2	3.48	2.49	1.35	15.66±0.16	2	24	20.56±0.16	6.32±0.21	0.66	2
c5705	(385705) 2005 UJ28	2.40	0.16	1.76	226.3	201.3	0.9	2.29	1.30	3.24	17.32±0.14	4	57	19.93±0.10	6.96±0.10	0.43	2
c5761	(385761) 2005 YK74	2.46	0.10	2.67	293.5	227.3	0.7	2.23	1.25	5.39	17.94±0.13	4	46	20.58±0.14	3.79±0.05	0.49	2
c5893	(385893) 2006 SJ232	3.00	0.04	8.65	351.0	334.6	4.0	3.12	2.13	1.57	15.74±0.15	2	46	19.99±0.09	5.58±0.10	0.54	2
c6056	(386056) 2007 FV35	2.36	0.19	2.38	169.9	75.9	0.8	2.33	1.34	3.04	17.49±0.15	4	57	20.31±0.13	5.39±0.09	0.48	2
c6547	(386547) 2009 DP14	3.01	0.09	7.00	325.3	220.5	3.4	2.77	1.78	2.08	16.13±0.23	1	22	19.81±0.08	5.55±0.22	0.73	2
c6578	(386578) 2009 EY1	3.03	0.12	10.08	142.8	164.7	3.6	3.37	2.38	1.17	15.97±0.16	4	45	20.64±0.14	4.57±0.06	0.44	2
c6813	(386813) 2010 FG57	2.66	0.14	1.19	253.2	254.4	1.2	2.30	1.33	6.19	17.56±0.15	4	47	20.39±0.13	11.16±0.27	0.67	2
c7114	(387114) 2012 TB161	2.67	0.12	3.41	170.6	323.3	1.3	2.36	1.37	2.29	17.46±0.15	4	59	20.16±0.12	3.28±0.03	0.43	2
c7135	(387135) 2012 TC196	2.45	0.08	5.77	340.3	254.9	1.2	2.40	1.41	1.11	16.59±0.21	2	40	19.35±0.06	4.19±0.04	0.65	2

Note. — Columns: asteroid’s designations, semi-major axis (a , AU), eccentricity (e , degree), inclination (i , degree), longitude of ascending node (Ω , degree), argument of periapsis (ω , degree), diameter (D , km), heliocentric distance (Δ , AU), geodesic distance (r , AU), phase angle (α , degree), absolute magnitude (H , mag), number of nights (n), number of images (m), PTF_R magnitude, derived rotation period (hours), lightcurve amplitude (mag) and rotation period quality code (U). The full table is available in the electronic version.

*Asteroid available in the LCDB.

^blightcurves with large amplitudes and deep V-shape minima.

^w*WISE/NEOWISE* diameter.

^eEstimated diameter from Eq 2.

Table 3. Asteroids with partial phase coverage.

Obj ID	Designation	a	e	i	Ω	ω	D	Δ	r	α	H_R	n	m	PTF_R	Period (hr)	Δm	U
00850*	(850) Altona	3.01	0.12	15.53	121.2	133.5	59.9 ^W	3.24	2.30	6.02	9.37±0.13	4	86	14.11±0.00	11.16±0.38	0.10	2
01100*	(1100) Arnica	2.90	0.07	1.03	304.2	23.8	17.2 ^W	3.06	2.08	3.05	10.39±0.11	4	79	14.77±0.00	14.55±0.22	0.09	2
01135*	(1135) Colchis	2.67	0.12	4.54	350.8	4.1	49.8 ^W	2.95	1.96	1.28	10.26±0.18	4	77	14.21±0.00	23.41±1.09	0.33	2
01449*	(1449) Virtanen	2.22	0.14	6.64	110.8	131.9	9.9 ^W	2.36	1.42	9.32	11.69±0.15	4	64	14.92±0.00	14.77±0.44	0.27	2
02009*	(2009) Voloshina	3.12	0.14	2.86	107.6	6.3	26.6 ^W	2.75	1.76	1.27	10.87±0.12	4	88	14.59±0.00	2.94±0.01	0.32	2
03014*	(3014) Huangsushu	2.36	0.23	0.99	140.8	180.6	6.9 ^W	2.89	1.90	0.78	13.15±0.15	3	68	16.96±0.01	24.00±0.62	0.35	2
03031*	(3031) Houston	2.24	0.10	4.34	317.8	249.1	6.8 ^W	2.11	1.12	4.17	12.81±0.08	4	62	15.06±0.00	5.61±0.06	0.17	2
03033*	(3033) Holbaek	2.24	0.09	4.74	166.9	67.3	9.1 ^W	2.19	1.20	1.81	12.68±0.09	4	82	14.97±0.00	20.00±0.87	0.15	2
03484	(3484) Neugebauer	2.59	0.18	15.37	116.1	176.1	6.9 ^W	3.07	2.11	5.47	12.75±0.11	4	97	17.20±0.01	12.63±0.32	0.10	2
04471	(4471) Graculus	2.86	0.16	13.87	345.5	43.3	11.7 ^W	3.10	2.12	1.99	11.90±0.19	1	17	16.34±0.01	11.85±75.42	0.49	2
04746	(4746) Doi	3.22	0.17	0.88	185.4	212.1	20.3 ^W	3.01	2.04	3.73	12.03±0.08	2	58	16.26±0.01	20.43±0.43	0.24	2
05008	(5008) Miyazawakenji	2.22	0.06	5.27	142.4	41.8	7.8 ^W	2.10	1.11	1.72	12.79±0.10	4	97	14.72±0.00	13.52±0.19	0.18	2
05450	(5450) Sokrates	2.81	0.12	5.23	145.2	318.9	23.6 ^W	2.55	1.56	1.76	12.22±0.06	1	19	15.40±0.00	2.98±0.06	0.21	2
05535*	(5535) Annefrank	2.21	0.06	4.25	120.7	9.0	4.7	2.08	1.10	3.55	13.65±0.12	3	71	15.74±0.00	21.33±0.99	0.20	2
05833	(5833) Peterson	3.50	0.03	19.36	306.7	120.1	29.9 ^W	3.43	2.49	5.18	10.82±0.14	4	72	15.98±0.00	27.43±0.81	0.24	2
06902	(6902) Hideoasada	2.75	0.10	2.09	214.2	129.2	9.5	3.02	2.04	1.98	13.12±0.14	4	92	17.32±0.01	15.00±0.24	0.36	2
08568	(8568) Larrywilson	2.16	0.10	0.87	44.7	242.4	3.1 ^W	2.30	1.31	0.92	15.08±0.16	4	87	17.61±0.02	11.29±0.13	0.39	2
09369	(9369) 1993 DB1	2.33	0.15	0.22	97.3	107.2	4.6 ^W	2.26	1.31	7.76	13.62±0.13	4	78	16.51±0.01	14.12±0.21	0.17	2
09457	(9457) 1998 FB75	3.17	0.18	0.47	32.1	51.8	11.7 ^W	2.68	1.72	5.26	13.07±0.19	4	84	16.80±0.01	22.86±0.56	0.36	2
09655	(9655) 1996 CH1	2.37	0.07	4.97	120.6	327.8	3.4 ^W	2.22	1.26	7.35	13.78±0.11	4	82	16.53±0.01	6.67±0.05	0.14	2
10792	(10792) Ecuador	3.07	0.09	10.27	157.2	177.7	10.1 ^W	3.35	2.36	0.52	12.79±0.27	4	85	17.41±0.02	18.82±0.36	0.90	2
10816	(10816) 1993 FZ35	3.15	0.14	2.65	116.4	217.7	10.2 ^W	3.49	2.53	4.53	13.58±0.16	4	72	18.68±0.04	14.12±0.40	0.47	2
11187	(11187) Richoliver	2.59	0.13	3.86	131.0	151.6	3.9 ^W	2.76	1.78	1.86	14.07±0.14	4	85	17.71±0.02	14.55±0.45	0.45	2
11286	(11286) 1990 RO8	2.38	0.14	3.20	159.3	324.4	3.8 ^W	2.08	1.09	2.45	14.61±0.17	3	57	16.64±0.01	10.67±0.23	0.44	2
11775	(11775) Kohler	2.17	0.03	3.37	164.9	245.0	2.4	2.18	1.20	2.47	15.08±0.11	2	43	17.40±0.01	8.21±0.14	0.37	2
12117	(12117) Meagmessina	2.47	0.18	3.07	158.3	19.0	3.1 ^W	2.07	1.08	3.04	14.53±0.19	4	85	16.58±0.01	14.33±0.21	0.66	2
12793	(12793) 1995 UP8	2.26	0.14	3.37	355.0	291.5	3.4 ^W	2.44	1.45	1.69	14.37±0.21	4	88	17.29±0.01	12.63±0.17	0.54	2
13187	(13187) 1997 AN4	2.27	0.14	0.97	286.0	311.3	3.7 ^W	2.39	1.43	7.49	15.24±0.14	4	78	18.44±0.03	12.97±0.55	0.20	2
13323	(13323) 1998 SQ	5.11	0.09	0.92	182.5	256.0	23.4 ^W	4.97	3.98	0.49	11.01±0.13	4	79	17.57±0.02	14.77±0.44	0.27	2
13580	(13580) de Saussure	2.82	0.23	5.82	294.0	79.5	6.4 ^W	2.75	1.77	2.27	13.91±0.10	4	80	17.56±0.02	12.31±0.32	0.17	2
13717	(13717) Vencill	2.28	0.05	2.23	212.1	30.1	2.5 ^W	2.28	1.30	3.64	15.40±0.13	4	77	18.13±0.02	24.00±2.18	0.33	2
14779	(14779) 3072 T-2	2.84	0.07	3.20	83.6	243.4	6.8 ^W	3.03	2.05	1.90	13.23±0.18	3	63	17.36±0.01	17.78±0.32	0.50	2

Table 3—Continued

Obj ID	Designation	a	e	i	Ω	ω	D	Δ	r	α	H_R	n	m	PTF_R	Period (hr)	Δm	U
15075	(15075) 1999 BF15	2.40	0.20	1.87	206.9	182.9	4.1	2.56	1.58	1.92	14.03±0.11	4	79	17.29±0.01	16.00±0.55	0.14	2
15352	(15352) 1994 VB7	2.39	0.16	2.81	223.2	197.3	2.9	2.32	1.34	4.65	15.03±0.13	4	76	17.86±0.02	12.63±0.17	0.30	2
15670	(15670) 1975 SO1	3.01	0.04	2.38	145.1	334.6	10.2	2.90	1.91	1.40	13.72±0.10	4	104	17.55±0.02	21.33±0.46	0.23	2
18188	(18188) 2000 QD55	3.10	0.23	3.37	51.9	301.3	7.7	3.77	2.79	1.56	14.30±0.20	4	70	19.62±0.08	11.85±0.29	0.58	2
18647	(18647) Vaclavhubner	2.54	0.04	3.72	141.2	39.1	2.7	2.44	1.45	0.91	15.29±0.17	4	83	18.16±0.03	33.10±2.14	0.56	2
19210	(19210) 1992 YE4	2.58	0.23	4.09	150.4	240.8	4.7	2.73	1.74	2.82	14.62±0.09	4	73	18.20±0.03	6.23±0.08	0.17	2
20106	(20106) Morton	2.65	0.16	13.35	323.1	104.3	3.2	2.52	1.53	2.61	14.94±0.14	4	70	18.20±0.03	8.97±0.08	0.20	2
20116	(20116) 1995 VE1	2.68	0.10	3.02	104.6	271.1	3.9	2.69	1.71	3.52	15.06±0.28	4	74	18.56±0.04	14.77±0.47	0.84	2
21119	(21119) 1992 UJ	2.54	0.19	2.37	307.7	96.0	5.7	2.57	1.58	3.08	14.96±0.22	2	41	18.41±0.04	12.97±0.18	0.70	2
23184	(23184) 2000 OD36	2.41	0.21	21.82	152.8	121.9	9.0	2.56	1.58	1.89	14.01±0.32	4	80	17.27±0.02	29.09±0.91	1.20	2
24615	(24615) 1978 VO5	2.29	0.11	2.58	271.9	120.1	2.2	2.23	1.25	4.77	15.09±0.12	4	70	17.67±0.02	11.03±0.25	0.21	2
24856	(24856) Messidoro	2.72	0.25	8.80	159.7	304.1	4.5	2.16	1.19	6.61	15.07±0.09	2	40	17.63±0.02	2.39±0.02	0.20	2
25014	(25014) Christinepalau	2.24	0.18	4.63	326.8	293.5	4.0	2.31	1.32	1.61	14.55±0.12	4	82	17.09±0.01	12.00±0.43	0.15	2
25469	(25469) Ransohoff	2.32	0.14	7.56	108.4	263.6	3.7	2.36	1.39	6.11	14.19±0.13	4	70	17.21±0.01	8.57±0.15	0.11	2
26138	(26138) 1993 TK25	2.79	0.10	3.30	179.1	141.7	3.7	3.05	2.06	2.20	15.36±0.36	4	71	19.60±0.07	32.00±3.56	1.26	2
29146	(29146) McHone	2.40	0.24	23.63	333.9	203.7	3.8	1.85	0.86	0.85	14.13±0.10	3	63	15.22±0.00	14.12±0.40	0.18	2
29219	(29219) 1992 BJ	2.36	0.13	2.92	124.6	334.0	6.3	2.16	1.17	1.32	14.77±0.09	3	60	16.91±0.01	12.00±0.71	0.09	2
29536	(29536) 1998 BC12	3.04	0.03	11.62	110.7	344.9	9.6	2.94	1.98	4.88	12.74±0.17	4	51	16.98±0.01	7.22±0.11	0.16	2
30111	(30111) 2000 FJ20	2.36	0.09	7.08	109.2	155.0	2.2	2.52	1.58	8.83	15.29±0.20	3	65	18.89±0.04	8.65±0.16	0.63	2
30343	(30343) 2000 JB36	2.37	0.16	2.29	359.3	202.6	2.7	2.24	1.32	11.44	14.68±0.15	4	65	17.72±0.02	7.56±0.25	0.16	2
30455	(30455) 2000 NB27	3.09	0.01	10.37	311.4	105.0	7.2	3.08	2.18	8.58	13.19±0.09	2	52	17.91±0.02	7.87±0.13	0.32	2
30971	(30971) 1995 DJ	2.44	0.28	7.80	337.5	56.4	4.3	2.64	1.65	1.44	13.83±0.27	4	86	17.48±0.02	32.00±1.10	0.68	2
31021	(31021) 1996 FW1	2.36	0.17	1.49	133.2	95.2	2.9	2.18	1.19	2.66	15.30±0.34	3	62	17.48±0.01	19.20±0.80	0.68	2
31987	(31987) 2000 HN28	2.42	0.21	1.46	307.1	38.6	1.9	2.73	1.79	7.88	15.62±0.26	4	62	19.60±0.08	9.70±0.10	0.97	2
32281	(32281) 2000 PP21	3.03	0.08	1.45	349.2	291.3	5.7	3.16	2.17	0.43	14.99±0.13	4	76	19.17±0.05	13.15±0.37	0.37	2
32358	(32358) 2000 QS124	3.12	0.07	18.05	150.7	341.0	6.9	2.91	1.94	4.37	13.37±0.11	4	81	17.49±0.01	21.82±0.51	0.28	2
39297	(39297) 2001 FE53	2.73	0.07	2.25	30.6	284.0	4.5	2.90	1.92	1.42	14.76±0.14	4	85	18.60±0.04	6.91±0.05	0.33	2
45837	(45837) 2000 RD27	2.46	0.14	14.21	325.9	324.1	3.6	2.69	1.71	2.03	14.91±0.26	4	79	18.40±0.03	32.00±2.29	0.79	2
46165 ^b	(46165) 2001 FF80	2.72	0.22	7.66	291.0	217.7	5.4	2.19	1.23	7.38	14.58±0.12	4	80	17.22±0.01	11.03±0.13	0.20	3
46769	(46769) 1998 HJ2	2.21	0.15	3.53	122.7	185.9	1.5	2.51	1.52	1.33	16.11±0.19	4	80	18.92±0.05	32.00±5.33	0.62	2
47340	(47340) 1999 XK39	2.25	0.12	3.37	157.3	222.8	1.8	2.40	1.42	2.11	15.65±0.22	4	82	18.44±0.04	40.00±3.08	0.79	2
48476	(48476) 1991 UP3	2.35	0.20	3.21	87.0	320.9	1.8	2.13	1.21	11.93	15.48±0.11	4	90	18.20±0.02	6.81±0.10	0.18	2

Table 3—Continued

Obj ID	Designation	a	e	i	Ω	ω	D	Δ	r	α	H_R	n	m	PTF_R	Period (hr)	Δm	U
48835	(48835) 1997 YK18	3.00	0.09	10.71	146.4	287.7	10.7	2.92	1.94	0.78	13.61±0.13	4	83	17.49±0.02	32.00±3.56	0.38	2
49889	(49889) 1999 XA158	2.26	0.06	4.27	142.0	46.0	4.9	2.14	1.15	1.17	15.29±0.09	4	85	17.41±0.02	7.06±0.10	0.10	2
51495 ^b	(51495) 2001 FO79	2.25	0.15	6.30	293.4	309.0	3.7	2.41	1.45	5.95	15.03±0.20	4	81	18.21±0.03	8.97±0.17	0.71	3
52199	(52199) 2465 T-3	2.33	0.13	2.11	295.4	138.4	1.9	2.10	1.15	8.61	15.63±0.36	3	37	18.24±0.03	6.04±0.04	0.82	2
53186	(53186) 1999 CB45	2.97	0.06	11.51	121.0	9.8	5.6	2.81	1.85	5.29	13.86±0.20	1	28	17.82±0.02	6.67±0.22	0.63	2
54272	(54272) 2000 JT40	2.90	0.04	2.20	163.0	111.9	5.3	2.95	1.97	1.32	15.13±0.19	3	48	19.06±0.06	16.27±0.79	0.61	2
55025	(55025) 2001 QF40	2.90	0.08	1.73	349.6	8.7	3.4	3.12	2.13	0.49	14.84±0.16	4	81	19.10±0.06	15.24±1.03	0.53	2
55860	(55860) 1997 BQ6	3.20	0.12	0.91	57.9	98.1	5.6	2.86	1.92	6.61	15.45±0.24	4	75	19.63±0.08	11.85±0.29	0.72	2
55917	(55917) 1998 FN30	3.08	0.13	10.70	346.1	299.0	5.0	3.30	2.31	1.34	14.01±0.10	4	79	18.58±0.04	9.41±0.18	0.34	2
56005 ^b	(56005) 1998 SK169	2.77	0.17	10.02	153.4	201.1	4.2	3.14	2.17	4.59	14.91±0.18	4	70	19.44±0.06	7.33±0.06	0.78	3
59408	(59408) 1999 FL40	2.42	0.20	2.05	295.5	175.6	1.9	2.01	1.03	5.29	15.61±0.09	4	82	17.49±0.02	7.50±0.12	0.20	2
61679	(61679) 2000 QH124	3.18	0.14	6.52	150.7	274.5	6.3	3.07	2.08	1.71	14.77±0.16	3	57	18.98±0.05	13.71±0.91	0.40	2
62606	(62606) 2000 SK325	3.19	0.14	12.72	344.4	96.1	5.6	3.02	2.03	1.60	15.04±0.38	4	81	19.26±0.06	16.27±0.27	1.15	2
63475	(63475) 2001 OB32	3.00	0.11	8.65	303.9	95.4	5.8	2.89	1.94	5.69	13.95±0.13	4	76	18.14±0.02	12.47±0.32	0.22	2
64036	(64036) 2001 SO190	2.38	0.13	1.47	153.5	318.6	1.1	2.11	1.13	3.52	16.83±0.22	3	55	19.00±0.06	11.29±0.26	0.64	2
64372 ^b	(64372) 2001 UQ113	2.40	0.17	0.22	146.4	88.4	2.0	2.55	1.58	4.99	15.50±0.10	4	82	18.73±0.04	9.60±0.19	0.26	2
64419	(64419) 2001 UG186	2.42	0.09	5.95	309.9	161.5	1.4	2.20	1.26	10.58	16.35±0.17	4	71	19.24±0.07	14.33±0.67	0.48	2
65821	(65821) 1996 UC3	4.01	0.23	4.31	302.3	103.6	10.7	3.57	2.63	4.91	13.61±0.30	4	66	18.82±0.05	6.44±0.04	0.71	2
66067	(66067) 1998 RM19	2.75	0.15	6.12	351.8	72.0	5.4	2.68	1.70	1.29	14.78±0.18	4	93	18.23±0.03	10.32±0.11	0.49	2
66468	(66468) 1999 RL17	2.67	0.13	2.88	256.0	183.4	4.1	2.37	1.39	4.09	14.92±0.18	4	79	17.87±0.03	30.00±3.33	0.43	2
67357	(67357) 2000 KS15	2.95	0.02	3.23	87.2	163.3	5.3	2.99	2.09	8.70	15.15±0.25	3	61	19.68±0.08	8.35±0.07	0.82	2
69561	(69561) 1997 YD2	2.17	0.06	4.37	286.6	246.1	1.9	2.09	1.12	6.13	15.61±0.32	3	69	17.79±0.02	43.64±4.36	0.97	2
69926	(69926) 1998 TZ31	2.84	0.19	3.81	286.3	113.7	5.3	2.63	1.67	5.88	14.86±0.11	4	74	18.59±0.04	22.86±2.43	0.28	2
70740	(70740) 1999 VG18	2.66	0.15	1.56	288.0	74.9	4.4	2.95	1.97	3.68	15.81±0.24	4	60	19.99±0.11	4.53±0.02	0.76	2
70741	(70741) 1999 VO18	2.69	0.05	1.65	305.2	118.5	3.1	2.61	1.67	7.96	14.81±0.11	4	68	18.56±0.04	13.33±0.38	0.33	2
71441	(71441) 2000 AR226	2.79	0.08	5.27	107.8	278.5	4.6	2.75	1.77	2.36	15.05±0.13	4	67	18.72±0.05	10.43±0.22	0.36	2
74103	(74103) 1998 QP31	2.31	0.08	6.49	107.6	31.4	2.7	2.14	1.16	2.56	14.42±0.12	4	75	16.66±0.01	6.19±0.16	0.11	2
75679	(75679) 2000 AU97	2.80	0.22	12.56	339.4	141.9	6.2	2.26	1.27	1.31	14.64±0.11	4	97	17.09±0.01	10.55±0.12	0.19	2
77873	(77873) 2001 SQ46	2.95	0.15	6.31	155.3	83.5	6.6	2.93	1.96	4.59	13.89±0.10	2	38	18.02±0.03	5.55±0.06	0.32	2
77926	(77926) 2002 EJ140	2.53	0.24	8.70	357.8	306.5	2.6	3.00	2.01	1.83	15.96±0.21	1	22	19.86±0.07	5.85±0.34	0.64	2
80176	(80176) 1999 UL38	2.24	0.17	5.43	321.0	80.6	1.8	2.30	1.31	2.28	15.79±0.12	3	57	18.37±0.03	10.79±0.12	0.30	2
82943	(82943) 2001 QG117	3.06	0.13	9.90	309.5	127.7	6.4	2.88	1.90	3.89	14.16±0.13	4	75	18.08±0.02	18.46±0.36	0.36	2

Table 3—Continued

Obj ID	Designation	a	e	i	Ω	ω	D	Δ	r	α	H_R	n	m	PTF_R	Period (hr)	Δm	U
83034	(83034) 2001 QT183	2.99	0.13	3.61	138.2	196.9	7.1	3.38	2.40	1.56	14.52±0.11	4	79	19.22±0.07	8.73±0.23	0.36	2
83962	(83962) 2001 XW123	3.17	0.09	2.61	99.1	176.8	4.7	3.44	2.46	1.58	14.76±0.20	4	65	19.68±0.09	5.19±0.09	0.66	2
84847	(84847) 2003 AW28	3.11	0.10	12.93	120.3	299.6	6.3	2.93	1.99	6.49	14.76±0.13	4	77	19.05±0.06	8.28±0.22	0.35	2
86474	(86474) 2000 CT79	2.80	0.04	4.06	163.9	341.9	2.9	2.70	1.71	0.47	15.16±0.09	2	43	18.59±0.03	9.50±0.19	0.21	2
90138	(90138) Diehl	2.29	0.06	0.52	218.3	124.6	1.2	2.43	1.45	2.45	16.64±0.13	4	59	19.61±0.08	8.07±0.20	0.43	2
93000	(93000) 2000 RJ83	2.55	0.12	12.03	309.1	142.1	3.5	2.26	1.32	9.18	15.31±0.14	3	65	18.26±0.03	6.04±0.08	0.27	2
96990	(96990) 1999 TQ215	2.69	0.21	2.99	117.2	339.4	2.5	2.33	1.34	3.16	15.59±0.24	4	72	18.29±0.03	8.57±0.08	0.71	2
97158	(97158) 1999 VV166	2.69	0.04	2.82	354.3	225.7	2.5	2.70	1.80	10.50	14.98±0.12	4	67	19.14±0.06	5.82±0.10	0.50	2
98617	(98617) 2000 WQ81	2.55	0.08	2.95	311.4	34.2	3.1	2.75	1.76	0.82	15.55±0.15	4	77	19.01±0.05	11.71±0.29	0.46	2
A5742	(105742) 2000 SH90	3.14	0.05	21.12	301.7	340.6	8.6	3.27	2.34	6.23	14.09±0.32	4	74	18.95±0.05	16.27±0.57	0.97	2
A6275	(106275) 2000 UY69	2.60	0.23	3.21	296.5	175.4	2.4	2.00	1.04	6.83	15.21±0.15	4	81	17.06±0.01	19.59±0.77	0.26	2
A9018	(109018) 2001 QA6	2.37	0.20	6.52	146.5	222.5	1.7	2.69	1.71	1.84	15.92±0.24	4	90	19.47±0.07	11.29±0.26	0.71	2
A9512	(109512) 2001 QA236	2.39	0.18	5.38	141.5	345.9	5.0	1.99	1.00	1.29	15.70±0.21	3	44	17.36±0.02	5.27±0.03	0.56	2
B4122	(114122) 2002 VW49	2.29	0.18	6.11	107.7	219.3	1.4	2.66	1.72	8.44	16.36±0.23	4	79	20.20±0.12	5.75±0.13	0.87	2
B4348 ^b	(114348) 2002 XY74	2.36	0.23	3.94	299.1	108.5	3.9	2.04	1.07	6.10	16.03±0.29	4	78	18.18±0.03	14.33±0.21	0.90	2
B4561	(114561) 2003 BP52	2.40	0.18	1.00	133.9	321.3	1.5	1.98	1.00	3.85	16.24±0.19	4	84	18.05±0.03	22.33±1.46	0.58	2
B7401	(117401) 2005 AL8	2.75	0.12	9.89	110.6	31.8	4.8	2.45	1.48	5.97	15.29±0.08	4	77	18.56±0.04	8.21±0.21	0.34	2
C1192	(121192) 1999 NC22	2.57	0.13	6.90	108.1	178.0	3.3	2.90	1.93	3.88	15.43±0.15	3	60	19.53±0.07	11.16±0.40	0.38	2
C2735	(122735) 2000 SW49	2.53	0.17	7.89	329.1	83.3	2.2	2.52	1.53	1.84	16.29±0.12	4	91	19.40±0.07	10.00±0.43	0.32	2
C2783	(122783) 2000 SY85	2.59	0.20	3.91	105.1	300.9	1.8	2.34	1.39	8.49	16.69±0.26	4	57	19.78±0.10	6.23±0.12	0.90	2
C8209	(128209) 2003 SS65	4.02	0.15	3.13	115.2	287.5	9.0	3.81	2.86	4.61	14.00±0.21	4	69	19.56±0.09	18.46±1.62	0.49	2
D1048	(131048) 2000 YM38	2.62	0.06	2.83	171.0	308.5	2.3	2.48	1.50	4.56	16.24±0.26	4	96	19.50±0.07	11.43±0.27	0.83	2
D2327	(132327) 2002 GA24	2.59	0.10	2.17	4.9	281.6	2.4	2.72	1.74	2.28	16.09±0.15	1	22	19.71±0.07	3.90±0.24	0.52	2
D2435	(132435) 2002 GL164	2.63	0.03	3.53	104.4	50.8	2.5	2.56	1.59	4.50	16.04±0.16	4	68	19.48±0.08	8.28±0.21	0.48	2
D5274	(135274) 2001 SH126	3.06	0.09	3.71	315.3	135.1	6.3	2.80	1.86	7.17	14.76±0.11	4	74	18.82±0.05	5.68±0.07	0.25	2
D5316	(135316) 2001 SN277	3.08	0.14	10.17	323.3	56.1	7.3	3.31	2.32	2.01	14.46±0.11	4	75	19.17±0.06	6.36±0.08	0.28	2
D7712	(137712) 1999 XU96	2.27	0.21	1.73	24.8	39.0	1.1	2.18	1.19	1.80	16.72±0.13	4	81	19.05±0.05	5.93±0.07	0.48	2
D8108	(138108) 2000 DC102	2.81	0.07	17.75	147.2	55.9	3.9	2.67	1.69	0.80	15.08±0.16	1	18	18.46±0.03	8.97±1.64	0.48	2
D8503	(138503) 2000 KC58	2.36	0.15	7.90	112.3	69.5	2.0	2.15	1.21	11.13	15.52±0.13	4	70	18.40±0.03	6.86±0.10	0.20	2
E7270	(147270) 2002 YT16	2.35	0.18	1.65	302.3	178.9	1.5	1.92	0.96	9.93	16.18±0.12	4	78	17.94±0.02	18.46±1.13	0.21	2
F1957	(151957) 2004 GE14	2.34	0.01	6.55	126.7	1.2	1.7	2.31	1.34	4.13	15.83±0.14	4	65	18.82±0.05	20.43±1.23	0.45	2
F3672	(153672) 2001 TO189	2.43	0.12	5.63	271.6	33.4	1.6	2.72	1.75	3.34	16.04±0.21	4	69	19.72±0.06	28.24±1.57	0.66	2

Table 3—Continued

Obj ID	Designation	a	e	i	Ω	ω	D	Δ	r	α	H_R	n	m	PTF_R	Period (hr)	Δm	U
F4428	(154428) 2003 BE48	2.37	0.21	5.30	151.8	272.9	2.5	2.25	1.26	1.41	16.87±0.15	2	41	19.25±0.06	8.14±0.20	0.49	2
F5740	(155740) 2000 SF46	2.53	0.19	13.33	304.5	5.8	3.6	3.00	2.05	6.03	15.23±0.19	4	75	19.52±0.07	8.81±0.24	0.45	2
F6926	(156926) 2003 FQ61	2.42	0.15	2.21	121.3	141.6	1.3	2.50	1.51	1.29	16.52±0.29	4	80	19.61±0.08	11.16±0.13	0.81	2
F7770	(157770) 2007 EO57	2.33	0.17	2.12	343.1	248.0	0.9	2.16	1.17	1.86	17.30±0.18	2	45	19.54±0.08	9.23±0.26	0.67	2
G0036	(160036) 1998 XH7	2.38	0.13	3.35	91.1	25.7	1.2	2.06	1.10	7.65	16.60±0.14	2	53	18.88±0.04	15.48±1.77	0.45	2
G3102	(163102) 2002 AQ125	5.18	0.05	6.26	143.8	327.6	13.8	4.97	3.98	0.37	13.07±0.17	4	74	19.41±0.07	6.08±0.04	0.54	2
G4380	(164380) 2005 EB148	2.88	0.02	3.12	136.0	1.9	5.6	2.84	1.87	4.23	15.02±0.14	4	74	18.98±0.05	12.47±0.47	0.26	2
G7647	(167647) 2004 DW37	3.00	0.18	1.58	78.1	37.0	3.7	2.46	1.53	9.40	15.94±0.29	4	58	19.42±0.07	5.93±0.04	0.86	2
G9134	(169134) 2001 QB36	2.99	0.14	10.75	319.2	56.3	4.8	3.08	2.19	9.11	15.36±0.35	3	47	20.08±0.10	10.21±0.21	1.11	2
H3082	(173082) 2006 UT265	2.99	0.22	5.19	329.3	343.2	7.0	3.58	2.59	0.25	15.34±0.16	3	42	20.24±0.11	10.21±0.32	0.47	2
H5110	(175110) 2004 NF9	3.16	0.19	3.40	292.4	324.0	4.1	3.23	2.24	2.13	15.37±0.25	3	43	19.96±0.09	7.80±0.30	0.83	2
H7288 ^b	(177288) 2003 XF	2.18	0.23	8.89	304.3	32.7	1.8	2.53	1.59	8.56	15.77±0.16	4	66	19.52±0.08	7.33±0.11	0.65	2
H8014	(178014) 2006 RG	3.03	0.08	9.29	333.8	340.6	4.2	3.24	2.26	1.29	14.99±0.17	4	74	19.46±0.08	16.27±0.79	0.48	2
I9772	(189772) 2002 CQ78	5.14	0.02	8.17	343.6	115.3	15.2	5.08	4.09	0.97	12.85±0.23	4	65	19.51±0.08	5.96±0.04	0.70	2
J0620	(190620) 2000 WC39	2.58	0.26	5.05	154.1	225.2	2.1	2.86	1.88	2.96	16.38±0.20	3	46	20.22±0.12	6.19±0.08	0.69	2
J4968	(194968) 2002 AQ178	2.53	0.13	1.68	86.3	66.2	3.7	2.25	1.33	11.00	16.29±0.27	4	74	19.36±0.07	10.55±0.12	0.84	2
J7166	(197166) 2003 UG277	2.77	0.05	2.97	270.5	223.6	2.3	2.65	1.67	2.89	16.16±0.17	3	54	19.75±0.09	7.93±0.31	0.54	2
J8675	(198675) 2005 CY2	2.74	0.18	4.43	126.7	306.5	2.4	2.34	1.38	6.56	16.10±0.14	4	69	19.31±0.07	12.97±0.55	0.40	2
K0296	(200296) 2000 AV218	2.78	0.11	2.76	312.6	98.5	4.5	2.65	1.72	8.38	16.02±0.24	4	54	20.02±0.11	5.33±0.06	0.77	2
K04X75P	2004 XP75	2.68	0.29	2.07	309.3	126.5	1.8	2.26	1.27	3.49	16.76±0.18	4	81	19.26±0.06	16.55±0.59	0.45	2
K09W25J	2009 WJ25	2.56	0.34	28.77	300.6	86.5	1.9	2.28	1.34	8.72	16.58±0.24	4	80	19.56±0.08	11.71±0.29	0.80	2
K09X12N		2.40	0.16	1.85	298.3	119.6	1.7	2.14	1.17	5.56	17.59±0.25	4	52	20.02±0.12	6.44±0.09	0.86	2
K6638	(206638) 2003 WA190	2.78	0.20	14.63	337.6	66.9	4.5	2.86	1.87	0.55	15.84±0.15	2	44	19.61±0.08	5.19±0.08	0.47	2
L1435	(211435) 2002 YM9	3.04	0.31	2.05	241.6	154.9	4.1	3.03	2.06	4.35	15.69±0.24	4	61	19.96±0.09	8.81±0.08	0.69	2
L4843	(214843) 2006 VO170	3.25	0.11	1.21	171.4	88.5	4.7	3.35	2.37	2.43	15.39±0.26	4	46	20.18±0.11	7.56±0.12	0.95	2
L7232	(217232) 2003 BU48	2.38	0.16	1.60	321.7	177.0	1.1	2.00	1.01	2.69	16.87±0.12	4	79	18.67±0.04	8.89±0.17	0.25	2
M5445	(225445) 2000 DO36	2.32	0.16	2.15	349.1	192.9	0.8	2.11	1.16	8.98	17.61±0.14	4	53	20.14±0.13	4.12±0.07	0.45	2
N0067	(230067) 2000 TG72	2.58	0.18	5.44	100.4	319.5	1.8	2.30	1.38	11.34	16.69±0.15	2	50	19.84±0.09	9.32±0.48	0.44	2
N5885	(235885) 2005 CK10	2.71	0.11	12.55	344.3	358.5	2.8	3.01	2.03	1.67	15.78±0.23	4	74	19.89±0.11	6.53±0.09	0.79	2
N6497	(236497) 2006 GU20	2.61	0.11	3.50	129.9	340.1	1.7	2.39	1.40	1.99	16.89±0.21	4	72	19.78±0.10	8.14±0.14	0.65	2
O1827	(241827) 2001 SR209	3.12	0.19	1.74	69.7	348.2	3.8	2.76	1.81	6.54	15.85±0.22	4	62	19.79±0.09	7.56±0.18	0.75	2
O2897	(242897) 2006 KH73	2.68	0.06	8.94	140.4	4.5	3.1	2.52	1.53	1.49	16.07±0.19	4	81	19.19±0.06	30.97±3.32	0.64	2

Table 3—Continued

Obj ID	Designation	a	e	i	Ω	ω	D	Δ	r	α	H_R	n	m	PTF_R	Period (hr)	Δm	U
Q8265	(268265) 2005 OF5	2.22	0.18	4.53	154.5	145.8	1.0	2.53	1.55	1.08	17.08 \pm 0.20	4	64	20.15 \pm 0.11	7.06 \pm 0.11	0.69	2
R5911	(275911) 2001 TD149	2.45	0.20	3.51	96.9	287.9	1.3	2.37	1.42	7.22	16.53 \pm 0.29	3	29	19.83 \pm 0.10	5.68 \pm 0.10	0.79	2
S2694	(282694) 2006 AO5	1.90	0.08	19.11	332.5	49.6	1.0	2.00	1.01	1.12	16.98 \pm 0.11	3	57	18.74 \pm 0.04	11.85 \pm 0.29	0.21	2
S5409	(285409) 1999 UF32	2.67	0.12	2.11	53.4	79.6	1.5	2.36	1.37	2.18	17.10 \pm 0.29	3	46	20.04 \pm 0.12	6.67 \pm 0.19	0.82	2
X1570	(331570) 2001 QS67	2.40	0.18	7.75	303.7	53.8	1.4	2.52	1.55	4.75	16.30 \pm 0.25	4	45	19.67 \pm 0.08	5.55 \pm 0.06	0.63	2
Y3133	(343133) 2009 FY1	3.04	0.09	12.32	108.9	356.7	3.6	2.76	1.81	6.43	15.96 \pm 0.23	4	61	19.94 \pm 0.09	11.16 \pm 0.27	0.79	2
Y7295	(347295) 2011 OM3	3.17	0.10	15.76	298.3	33.0	4.8	3.41	2.45	4.13	15.37 \pm 0.13	4	57	20.40 \pm 0.13	10.32 \pm 0.32	0.41	2
b3533	(373533) 2001 TF11	2.44	0.19	1.52	286.2	77.3	1.1	2.53	1.57	5.22	16.86 \pm 0.18	4	61	20.20 \pm 0.11	7.27 \pm 0.17	0.61	2
c6924	(386924) 2011 KV28	2.30	0.17	7.45	152.0	92.7	0.8	2.29	1.32	5.37	17.46 \pm 0.16	4	52	20.28 \pm 0.12	6.00 \pm 0.15	0.49	2

Note. — The amplitudes of the objects with partial lightcurve coverage and lightcurves with a single minimum should be treated as lower limits. Also, see note and footnotes associated with Table 2 for nomenclature and explanation.

Table 4. Bright asteroids with large lightcurve variation and without rotation-period determination.

Obj ID	Designation	a	e	i	Ω	ω	D	Δ	r	α	H_R	n	m	PTF_R	Δm
02979	(2979) Murmansk	3.12	0.16	11.42	148.5	197.2	18.5	3.60	2.62	1.55	12.35±0.18	4	83	17.41±0.02	0.60
03427	(3427) Szentmartoni	2.28	0.13	2.60	310.1	76.4	5.0	2.43	1.44	1.01	13.69±0.24	4	84	16.55±0.01	0.75
04251	(4251) Kavasch	2.41	0.18	3.34	115.4	132.6	4.3	2.67	1.69	2.77	13.62±0.17	4	69	17.20±0.01	0.66
04869	(4869) Piotrovsky	2.24	0.17	3.55	96.3	217.6	6.5	2.60	1.64	6.01	12.93±0.32	4	78	16.57±0.01	0.83
05827	(5827) Letunov	2.19	0.13	3.70	105.4	284.0	5.0	2.16	1.25	12.32	13.53±0.32	4	74	16.38±0.01	0.97
07321	(7321) 1979 MZ2	2.53	0.09	2.29	154.5	328.0	5.2	2.34	1.35	3.20	13.72±0.22	4	83	16.44±0.01	0.80
08475	(8475) Vsevoivanov	3.08	0.25	4.83	118.5	266.1	14.3	2.85	1.87	2.59	12.92±0.25	4	79	16.75±0.01	0.64
09319	(9319) 1988 RV11	2.25	0.15	2.94	165.5	97.5	5.5	2.32	1.33	1.02	14.87±0.18	4	85	17.53±0.02	0.66
10224	(10224) Hisashi	2.43	0.17	3.43	126.4	188.1	8.5	2.82	1.87	6.49	14.19±0.26	2	26	18.43±0.04	0.64
10252	(10252) Heidigraf	2.85	0.07	2.26	33.3	290.1	5.8	3.05	2.06	1.44	13.16±0.19	4	86	17.25±0.01	0.56
10943	(10943) Brunier	2.15	0.17	0.75	268.0	74.1	2.6	2.38	1.42	7.36	14.91±0.28	4	74	18.08±0.03	0.97
13468	(13468) 3378 T-3	2.32	0.16	0.88	138.1	8.5	2.4	1.98	1.03	9.07	14.83±0.21	3	72	17.07±0.01	0.58
15626	(15626) 2000 HR50	3.95	0.11	1.80	138.0	289.7	18.5	3.85	2.86	0.74	12.43±0.22	4	85	17.70±0.02	0.64
18721	(18721) 1998 HC146	3.21	0.05	7.22	106.0	149.2	11.2	3.32	2.39	6.40	13.59±0.22	4	72	18.54±0.04	0.56
18797	(18797) 1999 JT64	2.59	0.23	4.21	106.9	234.8	5.0	2.93	1.96	4.44	14.53±0.16	4	75	18.83±0.05	0.52
19178	(19178) Walterbothe	2.58	0.26	3.89	276.3	11.4	6.1	3.24	2.26	3.17	14.09±0.26	4	78	18.90±0.05	0.82
22034	(22034) 1999 XL168	2.68	0.06	6.79	331.6	196.4	4.8	2.51	1.53	0.79	13.50±0.20	4	84	16.34±0.01	0.67
22904	(22904) 1999 TL19	2.62	0.09	4.78	173.4	133.8	6.7	2.83	1.85	2.60	14.45±0.07	1	21	18.24±0.02	0.51
22973	(22973) 1999 VW16	2.70	0.11	1.93	288.5	89.3	3.9	2.70	1.73	4.02	14.54±0.27	4	76	18.30±0.04	0.85
23757	(23757) Jonmunoz	2.28	0.14	7.05	116.4	245.2	2.3	2.40	1.48	9.97	14.56±0.15	4	73	17.86±0.02	0.51
24527	(24527) 2001 CA6	2.19	0.13	6.90	335.4	34.7	2.1	2.40	1.41	0.48	15.39±0.26	3	64	18.12±0.03	0.75
25349	(25349) 1999 RL127	2.65	0.14	11.58	295.7	152.2	5.6	2.32	1.35	5.45	13.58±0.20	4	78	16.22±0.01	0.62
29074	(29074) 5160 T-3	2.86	0.23	13.96	156.5	133.8	4.2	3.26	2.27	0.53	14.02±0.13	4	77	18.49±0.04	0.64
30025	(30025) 2000 DJ26	2.30	0.17	5.53	150.0	138.4	2.0	2.51	1.53	2.23	15.53±0.22	4	81	18.67±0.04	0.58
32868	(32868) 1993 FM25	3.07	0.13	1.50	241.9	270.2	5.6	2.66	1.69	5.25	14.47±0.34	4	74	18.12±0.03	1.04
35501	(35501) 1998 FM41	2.56	0.14	0.76	254.2	200.0	2.6	2.23	1.27	7.53	15.21±0.18	4	80	17.92±0.02	0.51
36402	(36402) 2000 OT47	2.54	0.16	2.73	119.2	237.4	5.0	2.72	1.78	7.61	14.53±0.29	2	24	18.68±0.06	0.67
37445	(37445) 3056 P-L	2.40	0.13	7.20	295.6	317.5	2.8	2.61	1.65	6.26	14.77±0.14	2	33	18.34±0.04	0.79
38222	(38222) 1999 NP31	2.59	0.12	3.50	101.5	212.3	4.5	2.89	1.94	6.06	14.72±0.20	4	80	18.99±0.05	0.50
39574	(39574) 1993 FM5	2.66	0.11	2.20	104.1	297.3	6.2	2.55	1.59	5.77	14.97±0.35	4	76	18.44±0.04	0.97
40287	(40287) 1999 JS61	2.13	0.04	0.33	189.6	133.6	1.9	2.21	1.22	0.33	15.66±0.23	2	45	17.92±0.02	0.62
41967	(41967) 2000 XE39	2.59	0.18	12.33	326.0	73.3	3.5	2.66	1.68	2.65	15.31±0.20	4	61	18.81±0.05	0.55

Table 4—Continued

Obj ID	Designation	a	e	i	Ω	ω	D	Δ	r	α	H_R	n	m	PTF_R	Δm
42297	(42297) 2001 UL73	3.16	0.17	1.52	137.1	354.8	6.5	2.62	1.66	5.52	14.71±0.22	3	60	18.31±0.03	0.76
45610	(45610) 2000 DJ48	2.86	0.11	1.50	352.9	14.3	7.5	2.94	1.98	5.43	14.38±0.13	4	73	18.62±0.05	0.52
45904	(45904) 2000 YV29	2.68	0.13	13.31	116.9	340.2	4.2	2.37	1.45	10.83	13.75±0.21	4	76	17.06±0.01	0.64
46714	(46714) 1997 HF7	2.33	0.18	1.46	54.7	10.2	2.1	2.02	1.06	7.80	15.07±0.17	4	62	17.23±0.01	0.51
49589	(49589) 1999 CQ149	2.95	0.09	2.05	171.4	315.7	6.0	2.72	1.73	0.75	14.86±0.21	4	77	18.34±0.04	0.69
50886	(50886) 2000 GW39	2.97	0.13	0.82	65.1	276.7	6.4	3.18	2.20	1.69	14.57±0.24	3	26	18.87±0.08	0.64
51202	(51202) 2000 JR6	2.97	0.12	13.70	119.2	296.7	7.5	2.75	1.77	2.87	13.76±0.12	4	82	17.69±0.02	0.52
54158	(54158) 2000 HY48	2.37	0.12	2.24	66.2	108.3	1.5	2.19	1.23	7.59	16.14±0.23	2	45	18.80±0.05	0.85
54587	(54587) 2000 QM189	3.13	0.04	11.17	110.3	157.7	4.4	3.23	2.29	6.44	14.13±0.20	3	43	18.85±0.04	0.51
55652	(55652) 4048 P-L	2.98	0.08	2.44	217.8	139.3	6.9	3.19	2.20	1.93	14.21±0.18	4	73	18.68±0.04	0.57
56702	(56702) 2000 LQ28	3.14	0.25	15.78	313.6	37.0	12.1	3.79	2.82	3.59	13.07±0.26	3	60	18.56±0.04	1.15
57175	(57175) 2001 QD24	2.44	0.21	3.09	111.9	287.7	1.9	2.21	1.23	4.45	15.67±0.27	2	24	18.33±0.05	0.54
59263	(59263) 1999 CK30	2.43	0.19	2.25	100.6	301.1	1.9	2.24	1.30	8.96	15.64±0.25	4	69	18.54±0.04	0.69
59812	(59812) 1999 RA18	3.24	0.04	14.94	343.7	225.0	11.9	3.17	2.18	1.37	13.53±0.17	4	88	17.93±0.03	0.62
61480	(61480) 2000 QY39	3.04	0.09	9.89	328.4	322.6	8.1	3.23	2.24	0.74	14.21±0.17	4	76	18.65±0.04	0.57
62043	(62043) 2000 RH65	3.23	0.10	8.72	170.3	248.1	9.6	3.18	2.20	3.61	13.78±0.22	2	34	18.42±0.05	0.81
64387	(64387) 2001 UW144	2.38	0.15	2.40	91.5	145.4	1.9	2.28	1.29	1.88	15.64±0.23	3	64	18.09±0.02	0.55
67917	(67917) 2000 WU109	2.52	0.15	4.37	317.0	327.4	2.4	2.76	1.77	0.93	14.91±0.25	2	34	18.70±0.06	0.98
69727	(69727) 1998 HD145	2.57	0.12	8.10	140.5	125.1	2.5	2.66	1.67	1.45	15.21±0.23	2	40	18.51±0.05	0.61
70615	(70615) 1999 TZ204	2.71	0.06	2.75	302.8	164.3	3.0	2.56	1.58	3.29	14.99±0.26	4	82	18.29±0.03	0.86
75653	(75653) 2000 AG64	2.33	0.04	9.38	122.1	129.5	5.2	2.40	1.42	3.60	14.52±0.25	1	14	17.48±0.02	0.85
77831	(77831) 2001 QL226	3.00	0.07	7.73	310.4	178.5	9.2	2.79	1.81	3.54	13.93±0.11	4	81	17.72±0.02	0.56
78479	(78479) 2002 RO52	2.84	0.07	3.07	128.4	240.1	3.5	3.00	2.01	1.00	14.71±0.19	1	19	18.71±0.05	0.66
80448	(80448) 1999 YA17	2.31	0.11	9.72	293.9	99.1	4.1	2.25	1.28	5.19	15.31±0.20	3	51	18.04±0.04	0.65
80451	(80451) Alwoods	2.29	0.09	5.70	114.6	351.1	1.6	2.09	1.16	11.18	15.96±0.17	4	72	18.54±0.04	0.52
81985	(81985) 2000 QV122	3.01	0.23	7.82	333.5	292.2	5.4	3.13	2.14	0.38	13.89±0.20	4	86	18.01±0.02	0.59
83524	(83524) 2001 ST148	2.98	0.10	8.28	332.6	4.2	4.5	3.26	2.27	0.79	14.23±0.15	4	83	18.62±0.04	0.58
84852	(84852) 2003 AN38	3.06	0.08	9.79	144.5	71.1	7.6	2.95	1.96	1.40	14.97±0.21	2	34	18.96±0.05	0.52
88367	(88367) 2001 PY8	2.39	0.12	5.80	296.4	32.5	2.0	2.63	1.66	5.01	15.50±0.28	2	20	18.97±0.06	0.55
90232	(90232) 2003 BD27	3.12	0.19	17.62	155.4	334.3	7.8	2.55	1.57	2.69	14.59±0.29	4	78	17.87±0.02	0.83
90997	(90997) 1998 BC	2.49	0.04	8.05	329.1	263.4	3.8	2.47	1.48	0.64	15.04±0.27	4	88	17.89±0.02	0.93
93114	(93114) 2000 SE58	2.52	0.07	1.95	189.0	246.0	2.9	2.45	1.47	2.74	15.70±0.26	4	66	18.75±0.04	0.84

Table 4—Continued

Obj ID	Designation	a	e	i	Ω	ω	D	Δ	r	α	H_R	n	m	PTF_R	Δm
98404	(98404) 2000 UT8	2.56	0.21	0.36	36.0	1.5	3.4	2.72	1.73	2.10	15.29±0.17	2	33	18.79±0.07	0.54
A4108	(104108) 2000 EH45	2.91	0.03	1.38	244.2	15.2	3.1	2.98	2.01	2.52	14.94±0.16	4	76	18.91±0.06	0.54
A8184	(108184) 2001 HH15	2.24	0.22	5.05	342.7	313.4	3.3	2.57	1.58	0.51	15.61±0.31	1	22	18.71±0.07	1.36
B5812	(115812) 2003 UD243	2.75	0.11	2.71	96.9	346.3	3.2	2.63	1.64	2.37	15.50±0.13	1	20	18.93±0.07	0.63
C5001	(125001) 2001 TG154	2.42	0.10	6.76	105.8	290.3	1.8	2.35	1.37	3.64	15.77±0.19	2	24	18.55±0.05	0.50
C6117	(126117) 2001 YW113	2.54	0.17	12.67	293.2	140.1	2.8	2.20	1.24	7.25	15.81±0.38	4	74	18.51±0.04	1.15
C6488	(126488) 2002 CD55	2.53	0.14	3.74	317.3	285.2	3.5	2.48	1.49	0.85	15.26±0.16	4	69	18.37±0.04	0.88
C7599	(127599) 2003 BE18	2.40	0.19	0.37	65.1	354.1	1.4	2.08	1.11	6.48	15.97±0.18	4	75	18.27±0.04	0.89
D0982	(130982) 2000 WH130	2.63	0.16	3.21	77.4	29.8	4.1	2.21	1.26	8.60	16.04±0.43	3	52	18.82±0.05	1.05
D5405	(135405) 2001 TF226	3.08	0.23	16.85	150.9	258.2	6.5	3.11	2.12	0.59	14.65±0.21	2	26	18.86±0.05	0.66
E4543	(144543) 2004 EV94	3.01	0.08	15.72	150.5	90.3	6.1	2.97	1.98	1.43	14.84±0.32	3	60	18.89±0.05	0.84
E7041	(147041) 2002 RE65	2.33	0.26	4.83	105.9	256.5	1.6	2.40	1.42	3.56	15.27±0.27	2	23	18.46±0.05	0.61
E7448	(147448) 2003 YT136	2.24	0.07	8.11	119.5	328.3	1.2	2.09	1.11	4.94	16.58±0.15	4	69	18.80±0.05	0.51
F6799	(156799) 2003 BD18	2.37	0.17	0.81	149.1	284.6	1.2	2.23	1.24	1.14	16.59±0.20	4	80	18.98±0.05	0.84
F7530	(157530) 2005 TX17	2.41	0.15	3.03	141.5	286.5	1.6	2.13	1.15	5.06	16.41±0.18	3	51	18.74±0.05	0.55
G1236	(161236) 2003 AK29	2.36	0.14	3.21	294.4	199.8	1.2	2.04	1.05	4.24	16.58±0.22	4	72	18.54±0.03	0.62
G3890	(163890) 2003 SC199	2.77	0.07	4.39	297.4	92.1	4.6	2.74	1.77	4.16	15.24±0.16	4	72	18.90±0.05	0.63
H1914	(171914) 2001 SM75	3.12	0.20	4.49	306.0	112.5	7.9	2.94	1.97	4.45	14.29±0.13	2	28	18.48±0.04	0.68
I3712	(183712) 2003 YY61	2.22	0.16	4.94	105.7	299.2	1.2	2.05	1.08	6.18	16.62±0.14	4	69	18.80±0.05	0.57
J0951	(190951) 2001 VU62	2.44	0.13	2.64	332.4	122.6	1.7	2.23	1.25	1.61	15.53±0.20	2	37	17.83±0.03	1.05
J0991	(190991) 2001 XQ238	2.47	0.15	1.90	6.1	81.8	1.9	2.29	1.30	1.25	15.60±0.16	1	22	18.16±0.02	0.53
J3212	(193212) 2000 QE224	2.56	0.29	10.47	337.7	90.6	3.1	2.31	1.33	2.39	16.11±0.14	2	33	18.77±0.06	0.54
J3656	(193656) 2001 DK45	2.69	0.14	1.77	346.9	156.0	3.8	2.34	1.38	6.91	15.85±0.22	4	77	18.99±0.06	0.63
J5207	(195207) 2002 DN2	2.56	0.13	30.58	115.0	340.3	4.1	2.24	1.27	5.21	15.02±0.18	4	83	17.55±0.02	0.50
J7712	(197712) 2004 PS3	2.37	0.09	6.12	332.9	273.5	1.6	2.36	1.37	0.82	15.96±0.16	2	47	18.69±0.04	0.86
K9327	(209327) 2004 BC92	2.92	0.22	4.49	164.6	354.0	4.0	2.29	1.31	2.92	15.74±0.15	4	77	18.39±0.03	0.51
L6446	(216446) 2009 FA45	3.05	0.14	12.84	147.6	307.0	5.2	2.78	1.79	1.73	15.18±0.16	2	42	18.84±0.04	0.51
L7813	(217813) 2001 BD19	2.18	0.09	5.77	324.4	114.0	1.2	2.10	1.11	0.84	16.67±0.33	3	35	18.66±0.05	1.01
M0448	(220448) 2003 YF65	2.23	0.15	5.11	105.5	312.7	1.3	2.03	1.11	12.60	16.52±0.17	4	90	18.80±0.04	0.57
M2177	(222177) 2000 BL29	2.30	0.19	6.23	332.3	114.4	1.2	2.06	1.07	0.84	16.93±0.14	4	83	18.73±0.04	0.58
Y2031	(342031) 2008 RA108	2.59	0.16	14.12	332.9	72.2	3.1	2.64	1.65	0.97	15.54±0.30	4	55	18.81±0.07	1.52
c2447	(382447) 2000 DZ36	2.79	0.24	9.05	340.2	133.0	2.1	2.24	1.25	2.77	16.39±0.15	4	77	18.86±0.06	1.09

Table 4—Continued

Obj ID	Designation	a	e	i	Ω	ω	D	Δ	r	α	H_R	n	m	PTF_R	Δm
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Note. — Δm is the lightcurve variation over our four-night observing-time span. Also, see note and footnotes associated with Table 2 for nomenclature and explanation.